

LENNY LOUQUE: My name is Lenny Louque. I'm a senior piping and structural designer for H&K Engineering. We're located out of Baton Rouge. Most of our work is all done in chemical plants. We do laser scanning, design engineering or just multi-discipline. Our workflow for scanning, which is what we're really going to focus on today, is kind of what I wanted to focus on. It's really going to be catered to the chemical plants or to the refinery's sides on how we would do it for a retrofit job. Now the procedures and stuff will also work for a greenfield, a grass roots job, but mostly this is for small retrofit jobs is what I want to try to focus on.

So I want to try to cover these four points. Basically registering in ReCap Pro. How to clip or use the data inside of Plant 3D. How to bring that data into Navisworks, and then how to apply survey. Applying survey I've saved for last, it's one of the more cumbersome of processes that doesn't always cooperate. So we'll see how it goes.

So how many people in here are familiar with laser scanning? Y'all all deal with it? OK, so a pretty good percentage of y'all. That's good. When we start scanning for a project, this is kind of our workflow. It looks basic, but there's a lot more to it. We use two programs. We use Laser Control and ReCap as our two programs that we would use to register.

How do we determine that? We determine that mostly by the number of scans that they have. ReCap we try to limit for working under 20/30 scans. AutoCAD really gets cumbersome, doesn't like it when it gets too big. Now when we do a laser control project that's a bigger project, we always bring it into ReCap. So we always use ReCap for Navisworks, but we'd always register in ReCap.

So the job will depend on the size and then also how many people we're going to have working on it. If there's only a few people we can use ReCap and utilize it. If it's going to be a larger project we'll have to use another laser control, which is what we use for the ZNF. We have ZNF scanners.

So we start going through the process for registering users into ReCap. There's a couple of options we have, ReCap comes up with. When we create our project it would just import the scans. Now ReCap will give you an automatic registration and a manual registration. That's all. The automatic registration works good most of the time, but not all the time. I tend to go more towards the manual registration. And we will go through both processes.

So we'll start with that. So the auto register is just really going to be a video that I'm going to show, because there's really not much to be able to do here and live. So right here we go in here, we create the actual project name, and then we're going to go ahead and save it to the folder where it needs to go. Yes, this will be raw data coming from ZNF, correct. This would be ZFS files. This would be raw, consider we didn't register in any other software.

So from here we use the standard settings on here, we don't really mess with the filters and stuff. Like they have all the data possible that comes in. This is really where your time consuming part is, when you're importing the scans, especially ZFS files. This is the only file format where we work with. So I'm not sure, I couldn't tell you what the time would be on if you use a FARO scanner or [? Chivas ?] or something else. But for ZNF this takes-- this is really our time consuming part, that and the index and the scans at the end are the two that take the most time.

Obviously we'll skip through that through this video. Now these are some of the videos that I'll be able to upload later so y'all can see it and y'all can look at them. So from here you're going to pick the three registry options. And we'll go ahead and do the auto scan. There, again, it's a long process. It takes a little time. So we'll skip through it then you'll see it come up. Now this job is only four scans, so it was pretty simple. Now if you get into a much bigger job you may have to review them more and check them out after.

So then when it starts to index the scans, normally after the first scan, it's indexed. You can launch the project, this works in both manual and automatic. You can launch the project, you can actually start looking at the scans, moving it around, looking at the true view images that have come up and everything. We run all of our scanned data on a separate PC that's dedicated for processing data. So we don't have to tie up our users to do this. So normally we'll load it up, we'll leave this loaded up, and then you kind of see as it finishes throughout the process.

So that was really it for the automatic registration. Again, it works when it's only a few scans and they're in a tight area, in an area that can be recognized. If you start expanding the project, and the scan's spread out, I find it doesn't work as good. Especially in a scenario where you have a pipe rack, where you have geometry in the field that is symmetrical. Like if you have bends that are consistent, the program tends to stack them on top of each other, or even the tank farm area where you may have four or five tanks in a row that are the same

diameter, the automatic registration will tend to stack the tanks on top because there's so much geometry that looks the same.

So the automatic registration doesn't always work to your benefit. This can only be-- the registration can only be done in [? Peru, ?] correct. Sorry? Yes. Then it stays with the RCP, correct. No. Well, when we're targeting, if we do go back and we apply the survey to it then, no, it doesn't. But that would be a manual, that would be covered more with the manual registration.

So with the manual registration, up to a certain point, up to here would be the same. So you're still going to create the project the same way, and we're still going to import the scans. And I've already imported the scans for here. So this is where we're at. So it's the same four scans, we're just-- I'm going to do these manually just to show you the difference.

So you still have the same options. We have skipped registration, when we have manual or you have auto. We'll go ahead and do manual. Now, it does do this search and tries to fit it together for you, which is to search for a match. Again, this does work sometimes, but when you get into an environment where you have, again, like a pipe rack or a tank farm it will definitely cause you some issues.

But it does give you an option here to look at how it's going to overlay. The blue and orange will represent the two scans, orange one being on the left. So you can kind of see if it lines up, or you still have the option of picking points.

Now, the key to picking the points is being able to pick them in three different planes. So you know the ceiling, the wall, and the floor would be good. I find that you want to have them spread out and as big a surface as possible. A big wall, a big door, a big floor area, it works best with ReCap in my experiences.

So we'll start-- now, we target all of our jobs. Some of it's for reference for us to be able to register, so we can see. And we also if we want to apply a survey to this obviously we would use the targets to apply a survey. So right now I'm just using it just to pick common points in each scan. So this is doing like a scan to scan registration, cloud to cloud it's also called.

Again, once you pick your three points it will give you a preview. And then you'll be able to check it. If you like it, you can tell it merge and it will go through a little process. Again, it tries to-- what it does, it'll take the next scan in your group and it tries to compare it to the scan

that's open.

So sometimes it gets ahead of itself if you have to go in a row with your scans. Like I said, this is a small job, so it's not as big of an issue. Well, you could do one scan, because you can rotate it yourself. So if you just have one scan job you just want to bring it in and look at it, you can do one scan. And this one, again, if you like it you don't have to pick points if it all fits together, you can just tell it merge.

So it's kind of an automatic manual thing. It doesn't-- there's no way to stop it. What happened with this one it gives you the yellow. So you have green, yellow, and red, those are the three colors that it will give you. Green means all your points are within 6 millimeters, your overlap's good, and your balance is good.

This one, in yellow came back because of the balance, and the balance is between the points, the planes, and the objects that the program finds. With the plant type environment I find the balance doesn't always come in right, because we mostly dealing with an open environment, an open air environment. So we don't have as many big planes for the program to find. . So I find that the balance is always one of the issues that I've always had with Recap, getting a balance to come in.

So I try to make some overlap in my points or definitely within the tolerances of the program. The balance, sometimes we can't. If you click on it, it'll show you the overlay. The yellow would be the scan that we're overlaying, and that's what it's used in. The yellow is the balance, it's just kind of the points that it's using to try to balance it with the other ones, and the percentage just isn't where the program wants it to be.

So we'll go ahead do this last scan. And, again, it's the same issue with this. So once we have all our scans-- so all of these scans have been registered, scan to scanned, we have the option to come down here and we can preview.

Yes, that's one of the reasons why it's kind of hard to do a lot with ReCap, because it does take time to process. But this will bring in, you can preview the scans, make sure everything comes in. I come on over here, you can pick which scans you want to load up. Clicking on them it will load it up, the next scan. Dependant on the computer you're using, sometimes you can get four or five scans without it really causing a problem in this view.

So once you're done, all these scans are good, we're not going to apply this survey right now,

we'll do that later. Because this one we surveyed it a different way. So from here you can go ahead and tell it index to scans and it'll start compiling them and pulling them together.

You know we could launch the project, from this one I done ahead of time, so that's why it was quicker. We normally when we import our scans we normal don't clip them, we'll clip them out after. We'll come through Recap now and we'll start clipping it and making it usable. Anybody have any questions on what I did so far?

AUDIENCE: [INAUDIBLE] versus processing data [INAUDIBLE] software [INAUDIBLE].

LENNY LOUQUE: Yeah, there is a quality difference between Laser Control and ReCap. There's a big quality difference. Laser control has a better quality. When it's all said and done, in my opinion, the ReCap works better for, like I said, a small project because it comes with the suites. So I don't have to buy additional licenses for Recap for my users to use them. That's one of the reasons why I would use the Recap.

AUDIENCE: The regular Recap, not the Pro?

LENNY LOUQUE: The regular Recap, but I'm going to show you you can import the Recap file, the registered ZFS file insert into ReCap also.

That's not the one I want. It's fine. All right. we're going to pull up another job that we-- this will be a black and white scanner. Now this job is one that we registered in Laser Control, it's a much bigger job. This is almost 200 scans. So we're still able to bring it into ReCap and use it in Navisworks, and also use this in plant by breaking it up into regions and making it usable.

I scanned this job two different ways. We scanned it, then we surveyed it, and we registered it in Laser Control. But I also went back and re-registered it in Recap. I was curious about the difference, and it actually did a pretty good job. But if we look at our registration report, which is here, you can see because it wasn't planned ahead of time-- when you're scanning with Recap if you know ahead of time you really need to shorten your distances between your scans and make sure you're getting enough coverage definitely around corners and around different objects.

This job was scanned back in '06, so I just wanted to see how it would register in Recap now. And it did pretty good, but we can see in our registration report here that we have some deviations in here. And for the demonstration that was fine, I wouldn't be able to use this for a live project.

AUDIENCE: [INAUDIBLE]

LENNY LOUQUE: What's that?

AUDIENCE: [INAUDIBLE]

LENNY LOUQUE: [INAUDIBLE] You go up on home and then registration reports right here, data report.

AUDIENCE: What was your average distance scanned on that project?

LENNY LOUQUE: On this one I believe it was around 40 feet. We tried it when-- if I know for sure I'm going to use Recap I'll try to keep it within 10 to 15 feet. Now doing close it's quick for me to scan that is to survey. So when I do it that close I normally don't survey. I hang targets, but I'll just scan it, make it scan every 10 feet and it gets the coverage that--

AUDIENCE: So what is overlapping, what is overlapping, what is balance?

LENNY LOUQUE: The overlap is the amount of points that overlap between the two scans. And then the balance is the balance between the points and the planes that the program finds between the two scans. The balances--

AUDIENCE: Sorry. Does it overlap with multiple scans?

LENNY LOUQUE: No, just the two, just the two scans that you're registering to each. Other.

AUDIENCE: So does the scanner [INAUDIBLE] with GPS [INAUDIBLE]? Is there-- do the scans that [INAUDIBLE] for GPS position do they get positioned [INAUDIBLE] x, y, z coordinates in ReCap [INAUDIBLE] registered? Is there a ways to do that?

LENNY LOUQUE: Now the scanner we used for this job that's on the screen did not have that feature. It's a 5,006, which did not, it was just a straight. We moved it based off a survey. Now the other scanner, the color scanner, the 5010S, it does have it. And, yes, it will put it based off where you set it in the field. But that one, it does a lot of preregistration in the field as we're scanning. It will do some. It actually works off a tablet, and it does some pretty-- when we get back to the office it's pretty much almost registered, when we get back to the office.

So one of the big benefits we find with using Recap is the Navisworks, because even with LFM, which is an other program we use, we really have a hard time getting our scan data to

show up in Navisworks and look where we can use it. So no matter which way we register, we always bring it into Recap, even if it's just for the Navisworks ability. Now I'm using Navisworks Manage, but it does work on simulate also.

AUDIENCE: [INAUDIBLE]

LENNY LOUQUE: Right. oh, did they? I just loaded up 17, so if it's in you'll hear something different. But, yeah.

AUDIENCE: [INAUDIBLE]

LENNY LOUQUE: Yeah, but that's going to bring in individual files. I want to bring in a whole data set I'm bringing the whole data set into Navisworks. When you do just the individual files, with the ZVF files, definitely you can only bring in four or five [INAUDIBLE]. Five is the most I've been able to get.

AUDIENCE: [INAUDIBLE]

LENNY LOUQUE: Do they have that? OK.

AUDIENCE: Yeah. [INAUDIBLE]

LENNY LOUQUE: Yeah, the ZFS are not located, the ZFCs are. Well, it depends on what you use. See the ZFS files if you're using laser control-- we can talk about this later, it's kind of getting off the subject. But the ZFS files, if you use Laser control, are registered ZFC or converted after you run it through the program. But it's kind of-- we're going to stay on the ReCap.

So this is our main reason why we were able to do it. So we're able to take this, that scan set, bring it into Navisworks internal model, and we can walk through it you know just like we are here and just like we're there.

AUDIENCE: Is there a way for [INAUDIBLE]?

LENNY LOUQUE: No, not that I know of. Now and in it does break up the scans. So you know you can turn certain scans on and off, you can group scans together. It will not bring the regions over from Recap into Navisworks. It's kind of something I wish it would do, but it doesn't. So here you have to go make your own regions. But the point cloud does work just like you would any other object inside Navisworks where we can still create sections around the objects, boundary boxes. And let's see if we can--

AUDIENCE: [INAUDIBLE]

LENNY LOUQUE: Yes. Yes, you could do the same. So what am I looking for? So you can still use it as a-- so it still will take the point cloud and clip it with the objects. So it's kind of a-- so it still gives you that ability to narrow it down and look at the point cloud with our model.

AUDIENCE: Visualization only?

LENNY LOUQUE: Visualization only, that's correct. Some of the third party apps I think it gives a little more functionality, but this is--

AUDIENCE: [INAUDIBLE] the scan [INAUDIBLE]?

LENNY LOUQUE: Not really clean it up. You could filter it, it does filter some. I think you can give it a range. Normally if I want to filter I'm going to filter it through the scanner, you know through ZNFs applications. So say if they give a FARO scanner I would probably be better using the FARO application or whatever scanner it uses. It seems like it works a lot better. So let's see-- Wrong slide.

So using the point cloud in plant works out, for ReCap, works pretty good. I'm just going to pull it into it. This is just a default project. I'm just going to pull it up with the point cloud into it. Yeah, I'm going to use a pretty big job that we used. Normally we wouldn't use ReCap for a job this size, but I wanted to show some of the functionality behind it. Does bring in the regions, but I pre-created these regions.

So if you assign a design that will work in a certain area they can easily turn off to read when they don't need to work in, and it ends up with just this area that they need. To happens to be a little truck unloading area. So it still gives them the function, the ability. And then from here they can clip the point cloud down even further, and still get to work into it. And they can still be able to clip it down and work into it, work in it.

And we'll go to the back side and do some other stuff with it. Recap doesn't have as many functions as some of the-- if you're looking at a cyclone or some of the other third party applications-- but it does do some basic stuff that works out very good.

So we are able to come in here, and this is our truck loading area. So we have some options right here. It will find the center of a lot of pipe for us, and then from there we can do a line of pipe using plant. Just drop it in there, it will find edges of some foundations by picking three planes or two planes. It will pick the edge, and it will also pick you know the corner by picking

the three options.

So it gives you-- it doesn't do as much as some other, bullet but for what we do, we don't model a lot of the existing scans. We only model what we absolutely have to. So we only model a piece of a pipe or a flange or one valve. There will be no reason for us to go in and model this whole area unless we were doing a complete revamp of the whole area.

If we're just going to add a pump, which is what we did on this job, we're just going to model either our tie points and what we need. We're not going to get into modeling a lot of existing piping or existing equipment and stuff. We use the scan data with ReCap to check for interferences and clashes. We don't want to have to spend that time to really model a lot of this stuff unless it's required. But we have clients that will require it, and obviously we will do it. But the whole intention of us scanning is that we don't have to spend that extra time modeling existing data that's in the field.

AUDIENCE: So to apply 3D in ReCap Pro you can locate the center of the pipes and the flange [INAUDIBLE]?

LENNY LOUQUE: Can't really look at the end of a flange, it's mostly the center of the pipe. You still, with the flanges, you have to put them in and manually move them along the line or the pipe and get them in. You can visually put them in there.

AUDIENCE: [INAUDIBLE] correct?

LENNY LOUQUE: Yes. No, I think it came out in '16

AUDIENCE: [INAUDIBLE]

LENNY LOUQUE: No, '16 has the center line and stuff.

AUDIENCE: OK. [INAUDIBLE] flanges [INAUDIBLE].

LENNY LOUQUE: Yeah, they've got some other, if you want a model line of the existing there's a Clear Edge and there's some other programs out there that do that. But for what we do it's just we don't always need that part of it. And if we need to do that, if we need to get into more mileage then we'll have to use a third party program like LFM or Clear Edge or something like that. But you know for most of our jobs that are retrofit it's four of five scans, so we can change out a valve on our control station, you know, adding a little pump.

So it's small jobs, it doesn't really require a lot of existing modeling and stuff. So we tend to try to use this method here.

AUDIENCE: You can use ReCap Pro to do this simple [INAUDIBLE].

LENNY LOUQUE: Just plan to do the extracts. The only thing you would need Recap Pro for would be to register the scans.

AUDIENCE: OK, thank you.

LENNY LOUQUE: No one? One thing with ReCap is it will allow you to-- so if we have a new project, if you select files it will allow you to import a lot of files from the different programs, one being the ZNF project files. I see it also does FARO project files. So if you're using a FARO or you're using a ZNF or you're using [? Lyca ?] and you just want to bring in the registered project file, you can import it into ReCap. And I don't believe you need Pro to do that, just to import the files.

If they're already registered and you just want to bring them in and use them you can do it through the standalone version that comes with the plant. So the only way you would need Pro is if you actually want to do the registration in Recap. And we, in our office, we have one license for it because we can only do one at a time. So it works out pretty good. And like I said, we have a separate machine set up, so we let it run. It's time consuming.

So the guys are coming from the field we have them download the scans, start importing it. Normally they'll come back the next morning, register it. And it's normally a two day process, but it's not like two days worth of time.

AUDIENCE: [INAUDIBLE] receiving ReCap laser scan project how do we know that [INAUDIBLE]. So I don't have Recap Pro, I have AutoCAD and [INAUDIBLE] and I'm just going to take [INAUDIBLE]. How do I already know that it's registered?

LENNY LOUQUE: They should. [INAUDIBLE] should give you a registration report, which would tell you.

AUDIENCE: [INAUDIBLE] there's nothing within a file?

LENNY LOUQUE: There's nothing within a file. Well, if you see--

AUDIENCE: [INAUDIBLE]

LENNY LOUQUE: Well, not always.

AUDIENCE: [INAUDIBLE]

LENNY LOUQUE: RCP file will tell you it's been registered, that it's been indexed in ReCap Doesn't necessarily mean it's been registered because it could be on top. Normally they would send you a registration report to go with that. So my import, you know, we'll import-- if we do do it in a laser control we'll import the project file after, and then it'll bring it in.

So if you have to register in a third party and then bring it in, you can do that also. OK. So if anybody has any other questions on anything? So we'll look at doing some applying the survey to it.

AUDIENCE: [INAUDIBLE] trim off all that erroneous scan?

LENNY LOUQUE: Yeah, you could trim all of this out. I didn't scan-- I didn't do it for these, but you could do in Recap, you can Window it and then clip on, that would be on the inside.

AUDIENCE: Pro or?

LENNY LOUQUE: No, regular ReCap will allow you to do that.

AUDIENCE: [INAUDIBLE]

LENNY LOUQUE: Yeah.

AUDIENCE: [INAUDIBLE] when you [INAUDIBLE] in Navisworks?

LENNY LOUQUE: Right, that's correct. But you can change the limit box here and in ReCap. that allows you to bring it smaller. You can also, when you import the scans, there's a limit. There's a limit that is the brakes down. So that would be one way to do it would be to break it up like this and that would get rid of a lot of the erroneous scans. I mean, erroneous points.

AUDIENCE: [INAUDIBLE]

LENNY LOUQUE: Right, when you go in Navisworks you get all of the points come back. This is only-- the limit box only accommodates-- now when you import the scans, let's see-- So if we wanted to import another scan it does give you these options here to clip the points. So you can play with these settings and this will clip the points down. I haven't found that it works that great all the time inside of ReCap.

And this is also the intensity clipping. So if I want to clip the points, and when I clean them up I'm going to use the scanner software that comes with the scanner, and it be a ZNF or FARO, or something like that. I haven't really found that modifying the scans or clipping the scans inside of ReCap has really been beneficial.

AUDIENCE: Let me ask you real quick, the regions that you showed in [INAUDIBLE] were those created in 3D or were they [INAUDIBLE]?

LENNY LOUQUE: The regions are created in ReCap

AUDIENCE: [INAUDIBLE]

LENNY LOUQUE: Correct. Yes, they will come over.

AUDIENCE: But those regions don't come over [INAUDIBLE].

LENNY LOUQUE: Into Navisworks, that's correct.

AUDIENCE: Do they come over in Revit?

LENNY LOUQUE: I don't use Revit, so I couldn't answer that. I don't know if anybody else uses Revit could answer that? Do the regions come into-- I would think they should, because it should works similar to AutoCAD, but I'm not sure.

AUDIENCE: [INAUDIBLE]

LENNY LOUQUE: Do they? OK. So we'll talk about the regions real quick, again, just to show you. So to create the regions is fairly simple. It would be just been a matter of selecting a point cloud that you want. You come down here to regions and you could tell it new region, and then you can give it a name. Gives it a color, and a box over window. You can over here, you can change the color, if you wanted to, to a different color. Then you can also turn them on and off and assign them from here.

So this would be the regions that I've already created. And then the regions would come straight over into plant.

AUDIENCE: [INAUDIBLE] these kind of [INAUDIBLE]. So can you divide it into regions and take it one at a time to that--

LENNY LOUQUE: Yeah, you can take, for this particular scenario, if you were working in this area you can take

and export this section of the scanned data out into a RCP file. And then bring in just that section into plant.

AUDIENCE: [INAUDIBLE] you can do that with [INAUDIBLE] only?

LENNY LOUQUE: Think you can do that in regular one also. You can do that in regular Recap. The only limitation I know of that Pro has is the fact to allow you to register the scans. I think everything else should be able to be done in the regular version.

AUDIENCE: [INAUDIBLE] I'm not using this for [INAUDIBLE] process [INAUDIBLE] engineers. But can you use AutoCAD or [INAUDIBLE] architecture to capture those same [INAUDIBLE]?

LENNY LOUQUE: Yeah, it doesn't-- it will do the center of any kind of cylinder inside, it doesn't have to be a piece of pipe. In a plane it will find any plane, it could be a wall, for floor. Yeah, it doesn't know the difference between a processed pipe or plumbing pipe, it doesn't know.

AUDIENCE: [INAUDIBLE]

LENNY LOUQUE: Yeah, to get the planes like walls and stuff. Yeah.

AUDIENCE: [INAUDIBLE]

LENNY LOUQUE: I'm sorry.

AUDIENCE: You ever use this [INAUDIBLE] for regions or you just [INAUDIBLE] create a whole file and [INAUDIBLE]?

LENNY LOUQUE: I'm not going to bring the whole file and turn them off. As you can tell, like I'm trying to export this and it takes a little while. So I'm going to end up canceling this. But, yeah, normally I would bring in the whole dataset. And normally a project, a scan set, data set this size we wouldn't use ReCap for, except for inside of Navisworks. We would use a third party, we would use LFM or something.

AUDIENCE: [INAUDIBLE] an issue when it come to like [INAUDIBLE]

LENNY LOUQUE: Not really, try not to. I haven't really had that [INAUDIBLE] issue. This time I did right here, but I haven't.

AUDIENCE: [INAUDIBLE]

LENNY LOUQUE: No, to line them up. Yeah, to put a grid. There's no way to line them up to a grid that I know. No. Well, this particular scenario, like I said, this job we would never try to give this to our designers to use on a big project. Just when we added two tanks, a bunch of pumps. It was a pretty decent job, so we would never use ReCap inside of a plant for this, for a job this size, for this many scans. It doesn't work and the designers really have a hard time getting it to work for them.

And one thing that's kind of neat. I wanted to show y'all one more thing. The law of sectioning works also with the point cloud. Excuse me. We can in here and put a section plain. I got the wrong one. So I thought that was-- I think this is a pretty useful feature sometimes. It will allow you to do large sectioning with the point cloud.

So you can kind of help reduce it down. And it does do the-- Trying to get it to come back up. And it will do the section lines based off this. That works pretty good, works good on a small environment. But it will make 2D section lines across this plain. I think this is-- I can't remember if it came out I think it came out in 16, was it was first time it came out. It does take a couple of minutes to process, but come back to it.

AUDIENCE: [INAUDIBLE]

LENNY LOUQUE: Right. Yeah. As far as as-built modeling and stuff like, no. Everything we do is going to be retrofit on a small scale.

AUDIENCE: [INAUDIBLE]

LENNY LOUQUE: Yes. You could break this up, if you wanted to break it up in scans per job. If I want to use Recap there's a lot more planning ahead of time before you go in the field. You can't just send a crew out and say, go scan. We really had rather sit down and try to lay it out as much as possible, because of the way it registers and the dynamics kind of behind what can happen and what can't happen with it out there.

So this actually finished. So you can kind of see-- this particular job that we're looking at right now Recap wasn't even-- this was back in 2006 when I scanned it. So I didn't even know ReCap existed back then. So I don't even know if it did. But so I had no intentions of using it, I just tried this as a trial and error. So you kind of see what this plane does. It draws these plane, these lines through the plane. It's OK. It works much better on a smaller area. I didn't realized it was going to be that big of an area.

So you can kind of see, if you cut it right it will work a lot better. Unfortunately that was a bad call on my part.

AUDIENCE: [INAUDIBLE]

LENNY LOUQUE: Yeah, all our AutoCAD file and throw it onto external hard drives. So we copy the whole data set. Only 500, 500 gigs. All we give them is the final points, the final point file. All the additional data we keep on our server.

AUDIENCE: So there's a recommended workflow [INAUDIBLE]?

LENNY LOUQUE: Yes Yes, each designer has an external hard drive to hold the data. There are some network versions that are out there, but I haven't found one that-- you know when you start getting four or five users trying to access the same data set it just doesn't work. You know, the good thing about scanning it is once it's registered 80/90% of the time it never changes, unless you go back and re-scan it for a new job.

So when they have it you don't have to worry about constantly updating and stuff. And everybody should have the same data throughout the whole time. You know we keep our scanned data on a NAS system, so they can go copy it if they need it, if we do update it.

AUDIENCE: [INAUDIBLE]

LENNY LOUQUE: Yeah, we have our server copy it and then each individual has normally a 500 gig you know Western Digital hard drive is what we use. And they work out pretty good.

AUDIENCE: Doing demos, demoing, showing demos, how [INAUDIBLE]

LENNY LOUQUE: So for the way we would do that if we were going to demo like this right here we would export the images and then bring it into like Adobe or something and then cloud it and then mark it up that way. Yeah. There's other programs that we use that will actually demo the point flat out and show it that way if we were going to add a new pipe. But if we're just looking to give out demo drawings to our client, this is the way we would do it. Now what you can do with-- this is something new in '17 that just came out-- was the fact you can bring in a NWD file into the true view images, or real-view images.

So let's see if we can-- so this is inside of Recap. And we can-- so it's a beta.

AUDIENCE: [INAUDIBLE]

LENNY LOUQUE: Yes, from ReCap to Navis, yes.

AUDIENCE: That's not '17 then.

LENNY LOUQUE: No, this is bringing Navis into Recap. This is bringing an NWD file into ReCap, if I got enough points.

AUDIENCE: [INAUDIBLE]

LENNY LOUQUE: This was only available in 2017, it's a beta in 2017.

AUDIENCE: It's a beta [INAUDIBLE]?

LENNY LOUQUE: Yeah, it's--

AUDIENCE: [INAUDIBLE]

LENNY LOUQUE: You can save it down to a NWD file, and then you can attach the NWD file into here. But But for some reason it doesn't look like it's showing up. Not sure why it's not showing up. Yeah, I just figured-- I just seen that the other day when I loaded '17 for the first time. So I haven't really messed with it, but it's supposed to work. I don't-- I know this is where we did the work at, so I don't know why it wouldn't be.

AUDIENCE: Can you go into 3D and see if it's in there real quick? I 'm curious about that.

LENNY LOUQUE: No, it does not show up in a 3-D view.

AUDIENCE: So it is the idea that you would color code your pipes in Navis first? Then [INAUDIBLE] that into ReCaps [INAUDIBLE]?

LENNY LOUQUE: I'm not sure what-- mostly I guess for interference to check your new design based off the old design, to be able to see that. That's a big feature in other third party programs, that you can overlay your model with the scan. And I think they were trying to accomplish that, which I guess I don't know why, I can't answer why it's not working right now. Any other questions?

AUDIENCE: So in ReCap its reading is the only way to identify group points similar [INAUDIBLE]?

LENNY LOUQUE: Yeah, regions and values would be the same.

AUDIENCE: Just [INAUDIBLE]?

LENNY LOUQUE: Yeah. Yeah, that is a--

AUDIENCE: [INAUDIBLE], you know, you go [INAUDIBLE]

LENNY LOUQUE: I think it's node.

AUDIENCE: [INAUDIBLE] the point cloud all this you can [INAUDIBLE].

LENNY LOUQUE: OK, yeah. That's new in '17. Yeah, so it would allow you-- it was in [INAUDIBLE]. OK. So obviously if you've got too many old snaps it won't work. But allowing you to snap that's good and bad because you have so many points you don't know if you're picking the right one.

So you take the average out. And, again, for us we don't model too much scanned data.

AUDIENCE: [INAUDIBLE]

LENNY LOUQUE: Right. They do have the-- one thing about ReCap, it does allow you to go into-- you can do the Auto Desk 360 and upload the Recap. Oh, I don't have the internet. And it's probably going to be too slow in here, but you can upload the ReCap file to Auto Desk 360 and share that with clients and stuff, and they're able to view it. Most of our clients have Navisworks, so it's not an issue. But if you want to have that ability. And they'll have the same ability to take measurements like we do here. And I'll show you, we've got a few more minutes, I can show you. Let's see. A few more things.

So inside of ReCap it will, if you want to take a distance, it does have this pipe snap which will allow you to snap to the center of the pipe. So if you wanted to take a dimension, don't have the whole key. So you can go from center to center. So we can just go right behind it. This was a lot of small lower pipes so I don't know if it will pick it up. But it will Pick it up, it gives you the diameter of the pipe of which you went from each point. This one's set up in meters. Lost my project. There we go, try that again. OK.

I don't know why it's going there. So we come to settings we can change it. You change the feet and inches and it would give me-- so you use the pipe snap and it will snap to if you hold the Alt key down or go to the center. And you can watch the circle and when it changes it knows it, it picked it up. from here we can go down to the ground. If you hover on this it gives you the size of the pipe, all of the elevations you need of it, four inch pipe. And then if you go

down here it will give you the x , y , and z of each point.

So it's kind of a little something new I think that that's come out in '16 also. So if anybody's got anything else? Any more questions? So I'll send an email out to everybody. I'll upload some more files, some more of the videos and the files after the class and we'll have some more, little bit more of the information I just talked about. So I appreciate everybody coming and y'all have a good afternoon. Thank you.