

**File:** 1May2020\_003

**Duration:** 0:41:07

**Date:** 1/05/2020

**Typist:** Scarlet

START AUDIO

Interviewer 1: I want to ask you about your experience with using asset registers. The research project involves interviews with stakeholders using assets registers with different roles and from different companies. The purpose here is to try to understand the role played by asset registers in the maintenance optimisation and enhancement process. In particular, this research will explore asset register quality, challenges and production. Our research is also interested in the use of digital software technologies for supporting asset register production and use. In part, this research may help the University of Salford (and potentially partner organisations) identify opportunities to develop technologies, techniques or tools to help organisations and support their software development processes. I want to ask you the following questions and tape record your answers. I do plan to publish interview transcripts and extracts. Can I switch on the recorder?

Respondent: Yes

Interviewer 1: Thanks very much for agreeing to do the call. Do you want to sort of just give us an overview of your current role?

Respondent: So I studied petroleum engineering at University of Aberdeen in 2016. I joined Add Energy straight away. Started with technical assistant mended in sort of Asset Register work

descriptions, object types of class codes, hierarchy, and practicality. After that I sort of progressed more to become an analyst. Rather than doing the more engineering, it was overall the work in CMMS system. After that I transferred a little more back to a bit more engineering work. Did a couple of PAVs, asset verifications, desktop verification. My job title is still analyst but I kind of switched between both. So for a project I can do some engineering work someday and prepare a template. I am kind of stuck between the two right now.

Interviewer 1: So do you mind just telling us what an asset register actually is? And what's its purpose?

Respondent: So for me an asset register is different than an equipment register, a maintenance asset register. There is difference tags on what to put inside the CMMS system. When we talk about an asset register, you mean what should actually go into the CMMS system, or are you taking about more in general?

Interviewer 1: Um, initially in general. And then how you guys use it for optimization that would be good. But what is it in general?

Respondent: So, in general, different companies or different people have different views. Some people say an asset register should include everything and other people go with a more maintenance asset register which is maybe only maintainable tags and the tags of the smaller valves that would be maintained and sort of just cracked up against. So if you've got like a quarter inch valve you don't necessary maintain it. You just see if there is a crack and then replace it. Um which kind of starts the whole argument around what an asset register is and what should be included. And then it depends on who you are working with. Oh we want this, oh we want this. I worked with clients that don't want any valves under 2 inches and manual valves. Other clients want everything. So you can see the pros and cons of having a quarter inch valve in your

system. It comes down to the cost to the client and the CMMS cost and potentially money and getting a bigger license etcetera.

Interviewer 1: Ah right so the bigger the asset register the more expensive it is to maintain or operate?

Respondent: I have never actually been in an operations company but that is what I got from some clients before. That they have you know, they came up with the figure. Each tag costs us so much a year to actually have within the system.

Interviewer 1: Do you have a ball park figure of what that might be?

Respondent: No I don't have anything researched that would back up or anything, I can't remember the umbrella I was told back in the day. But you know, if it comes down to the operational, I mean all the different operators have all these standards of what they adhere to. And everyone thinks that they have the best way forward.

Interviewer 1: What is the asset register being used for would you say?

Respondent: Um so within the CMMS system, the asset register should be a list of equipment that is your asset. So it should include all the equipment that is potential on your site. And again it just come down to how far you want to go. Do you want to put everything or do you want to just cut things out due to cost or due to the fact they are not actually being maintained. Then there is the whole sort of software tags. Do you include them or do you not include them? Because you can maintain them. You've got sort of the system tags that do not exist. There are ways that you organize an asset register. So the kind of organization is something that we spend so much time on. How do all the different pieces of equipment interact with each other? So it is kind of like a functional location hierarchy. So you have the systems that are divided by countries, so Azerbaijan for

example or Nigeria. Then within there, each platform would have its own sort of template or system so for example oil going down to sort of packages. And then within that you would have your main equipment. Underneath your main equipment, underneath the pump you would have a mortar. And then even within that, all clients have different ways of organizing the asset register. And they think certain things should go in certain ways. There is kind of an overall flavour. But clients don't want any skid or package tags within their asset register. So they just want equipment and in my opinion it is better to have these because it kind of grips everything together. So some valves may not actually be on a compressor but on a skid or package for that compressor are directly related. It kind of gives it poor organization. It gives better organization when you are trying to frame something within the asset register. That's probably the main Asset C, when we are building the hierarchy just we never had the visual representation of things falling underneath, how they are following, the tree view and the dragon drop.

Interviewer 1: Could you tell me about your roles specifically. You are creating, well I'm putting words in your mouth, are you involved in creating the asset registers I think?

Respondent: So normally clients come to us with either their current asset register or if it is a completely new project they don't have an asset register at all. They are working on a completely new project. So normally it is just finding the gaps. So we have civil engineers and drawings that we use. I am not sure if you have ever seen a PNID before, single lane diagram.

Interviewer 1: Since we are doing this in audio recording you need to briefly describe what you mean by that.

Respondent: The system engineer drawing sort of tells you everything. Say if you have a pump, all the sort of associated equipment with

the pump, the fluid that comes in, where it comes in from, where it goes to, what this sort of equipment is in connection to that pump. That is kind of bread and butter from building an asset register. Normally we call that desktop asset verification. So we take the engineer and drawing and we take the fire and gas diagram. And we extract all the equipment tags, well the functional location tags, of the drawing. And each functional location tag represents a piece of equipment that is currently on the plan. And they are all done to a spec. They have sizes. They have the line sizes. Every bit of equipment is represented by a unique identifier. Then each client has a different way to tagging all there equipment. So there is no universal way of being like all ball valves are BLVs. Some things are more consistent like PSVs, Pressure Safety Valves normally have some sort of system. PSV and then some sort of identifier code at the end of them. But again it is not really consistent across clients and across the industry. But that is kind of our burden. You know. These IDs, if they are as build, reflect exactly what is on site. So in a way we can see what is actually on the site without being there. One of the problems is CSA was build 20 years ago. A lot of things may have changed you know. A ball valve [inaudible 10:56]. A level cage is no longer there. So that is when the sort of physical asset verification to get what is actually on site.

Interviewer 1: And so you then, I am just trying to understand, on one hand you do you desktop verification but then you may need to visit the site and then actually look at what is there and do, what did you call it, the physical asset verification?

Respondent: Yes. If we are doing the desktop asset verification we can only take it as far as the information and documentation that we are given to get an asset register. So, you know if the drawing says there is 10 ball valves on PNID101 we extract then 10 ball valves. But if that drawing is 20 years old and there has

been major changes to that PNID then we have no way of knowing that. So I have been used to go down and get that information. The most effective and the best way is to take someone to make up that PNID and redo it as as-built PNID that reflects exactly what is on the site.

Interviewer 1: From your experience, what is the sort of challenges that clients have with asset registers?

Respondent: Normally they are incomplete. [Pauses] so there is normally, there is always gaps in asset register when we get them in form a client. There is normally a little bit all over the place of added tags here there. Or they want it to all follow the same procedure. Or they want to change the procedure. The description sometimes as well, normally it is quite vague. Just ball valve, LP gas system, oil export system, you know it doesn't really tell you much about the ball valve, or the export system, if there is a 100 ball valves

Interviewer 1: Can you say a bit more about what critically means to you?

Respondent: So, criticality is one of these things that depend on the client and could mean a different thing to them. But in general it says how critical that piece of equipment is. So clients tend to look at them in sort of criticality sort of business safety and environment. But if this piece of equipment was rendered unavailable, what would the safety outcome be? So for a pressure safety valve, does that potentially cause harm to people? Potentially maybe kill someone if that equipment wasn't there. So in that case it would be a say. Different clients have ways of determining how much, how high that would go. Does it have a backup? If there is two in parallel that would be less transferable to halt in the same time. And what is the overall outcome? So if there is like a high pressure separator, the separator could potentially explode. I am sure you have seen over the internet big metal containers flying over the sky.

Interviewer 1: I have to confess I haven't. But maybe you can send us a URL after the call is finished?

Respondent: If it is high risk to injure a personnel then it would be an A. Or if it is a high business risk, let's say a main oil pump or a generator. If that generator goes down then would have to shut the plant down causing them however many thousand barrels a day production. So it kind of depends on the client. And even within that, if it is a lower producing region than a higher producing region, then say 10,000 barrels somewhere will get them an A while 10,000 barrels it's a different place with a lower production, wouldn't get them an A. it just depends how much that region produces.

Interviewer 1: So, that leads me on to wondering how would you assess the quality of an asset register?

Respondent: So, there is some sort of queries that I would normally run, part of what I do when I get data from the client. Some are manual checks but first I go look for the blanks and is there blanks within the class codes, is there blanks within the critically. I mean if there are fields that aren't filled in then straight away you know that there is work that can be done. There is another one were you sort of look at the levels of the hierarchy. So a lot of the time what we see from the clients is just a system then two levels underneath that. So maybe you have your oil export system and oil pump, then everything just piled underneath there pumps and motors all on the same level. And that really doesn't give an indication of how things are actually represented on the plan. That is what we tend to call a flat hierarchy. So that is one of the star checks. The descriptions we start looking at them. Could they can be improved? Are they just very vague? Are the class codes consistent? This is another one. Is the criticality consistent? Do they have [pauses] I have seen asset register with 2%

criticality. Why is that? Should maybe be more within the 10 and 15 or 20%. So, the range depends on each individual client's own guidelines. But there is some sort of ball park figure which will tell you that is there is something wrong. Is there stuff missing from the asset register?

Interviewer 1: Right. I heard you mention Asset C. Could you describe what your involvement in the Asset C register is so far?

Respondent: I have been a front-end user of Asset C, I year and a half ago now. I started using it to build hierarchy. We use it as a tool to demonstrate what we have done to the client. The client will start to visualize what we built in a way that we can't do if we were using a spread sheet. So I have been a front end user. I haven't been involved in any sort of development.

Interviewer 1: What is the advantage of the visualizations that you make? Why would that be a good thing?

Respondent: Um. So, if you just have a spread sheet that says pump A is here and it is just sort of all lanes. So you've got all this big list of equipment that sometimes could be [pauses] the biggest asset register I have worked with was 750,000 tags. So getting a client to stay engaged when you are trying to go through maybe 600,000 of tags is quite difficult. You know they sort of just gone through oh what is that? And then they can only see the description of one and they can't see the others. We keep them more engaged with that sort of visualizes. We would say, okay, so here first of all this what we are working on and then where would you like to work too. Cause it is broken down within their system so we can do sub systems little by little. This keeps them focused and we can see okay underneath that there is that. And underneath that part there is something missing. Okay where is it. So we will put it down here. And there is maybe nuances that fall within the general rule. So there is always that 5 to 10 % that doesn't follow the general



rule set. We can visualize that and we can open up every other node and see. Okay down here we have this, this and this. It gives them and allows them to see is a more sense what is actually on site. Not sure if you have ever been to a site, but imagine, what is the easiest way to explain this? [Pauses] I don't know, let me have a think [pauses].

Interviewer 1: It's okay. I'm waiting with bated breath. I have been to a site but it would be really good if you can explain. I mean you are sort of thinking in terms of visualization. You were talking about the sort of organization and hierarchical kind of relationship between the subsystems and assets is that right?

Respondent: Yeah. That is one of the main advantages I think. The other advantages is having a database where everything is recorded and all changes are recorded. As a data analyst that is my primary focus. Making sure no data is lost no data is changed. You know in a spreadsheet, sometimes someone controlled and copied between lines and suddenly you lose 500 lines of data that is needed. In Asset C they have the recording and the tracking. You know if someone makes a change, they go oh sorry I changed 10,000 lines. You can just revert back because it tracks all the changes. Making sure we can show the transformation from what the client first gave us, which in case is an original asset register and what the final outcome was. If huge, we can then program stuff at the back end to be able to run queries and show the 20% changes bla bla bla. Always have that sort of reference point very good for me. Here we added this. We can do this. We can do that. They will be able to see the transformation throughout the whole thing is good.

Interviewer 1: And I distracted you because you were thinking about how you can describe relating this to the plant. So do you want to have another go at that?

Respondent: So if you have been to a plant. You sort of know that it is divided to areas and systems. You know maybe you have an oil export area. We use that as an example. You walk to the oil export area and you see sort of a massive oil export pump. That will have a sort of a skid around it and all that sort of resources and equipment of oil export pump will be part of it. So you can visualize that in the hierarchy. Then underneath that you have the pump itself. So if you walked up and looked at the pump you have all this associated equipment. That will be underneath it. Then you would have a motor. They will be able to visualize that by the way it is set out at the plant. It allows the people to find what they are looking for easily. So for example if my description weren't very good but I knew that one of inland isolation valves was broken. They would go in and find that easier within the hierarchy rather than it was just oil export and 300 hand valves underneath.

Interviewer 1: So, if I can say back to you what I am understanding from this. Asset C makes a more logical grouping of [sound break]. What I was trying to say is that Asset C allows you to organize the asset components and line items more logical in the way they are actually grouped on the plant. Where as in a flat form spread sheet they just sort of list the items and the organization of that list is perhaps less apparent to the user. Would that be fair to say?

Respondent: Yes, so the organization that has been done by Asset C makes it easier to do and easier to visualize and easier to demonstrate the final results to the client.

Interviewer 1: Great. Great. And would you say that you are able to do everything in Asset C or do you find yourself switching backward and foreword between Asset C and some other ways of handling this data?

Respondent: I do use excel maybe a lot for transformations, some sort of formulas. Sometimes it is easier to extract raw data [inaudible 26:35] in excel. And then use Asset C for the sort of finer tweaking part of it. That is what sometimes we consider doing. The sort of data part where you just sit there extracting 200 lane items a day can sometimes be done in excel just because it is easier. But there is no sort of visualization. It is a bit like data mining maybe with some formulas, etcetera to sort of speed things up. Or concatenation formulas to process the descriptions. So sometimes object type pairing equipment description system and I sort of then tag a code at the end, I find that easier to do in excel. You just put these side boxes and then do the concatenation do some substitutions and actually you get of kind of finished description that needs to be queued. And that tends to be easier to do in excel because they can sort of copy paste a value and maybe change one or two things that falls outside the formula. Because the formula never never manages to give 100% accuracy throughout the entire thing. So for things like that and yeah manipulation, pivots, all sorts of stuff. Put the data in excel and maybe do a little bit of reporting in that way. Because although Asset C is a great tool it is sort not fully put out. It doesn't have the reporting tools and all sort of stuff. You know rather than...I have got backend access now and it is a little time since I have used Asset C. I am actually implementing it on Monday again for a project I am working on currently. Um so access to the backend and to be able to build queries and stuff. We spoke to Hoss [Research and Development Manager] about that. So getting the standard queries are going to always be there. Like is there gaps, is there blanks in the class code? Is there blanks in the criticality? What is the percentage of this? Again different clients, different systems. I always tend to use different [pauses]. It is kind of hard to always have the object type in the same column. Some clients use two criticalities.

Then when you start gathering the maintenance part there will be more differences as well.

Interviewer 1: So, I guess you have been touching on this. But would you say are the main challenges in using Asset C specifically?

Respondent: [pauses]. It has been a while since I actually used Asset C. and I am sort of frontend user capabilities. So I know Hoss [Hossein Ghavimi, Research and Development Manager, Add Energy Ltd.] has done an update and tweaked and changed some things since I last used it. I was away sort of working on a different project. So, I don't know what he has implemented to make it easier. But throughout the process when we first got it, we sat down with Hoss [Hossein Ghavimi, Research and Development Manager, Add Energy Ltd.] and there were certain things that we added to Asset C to make it user friendly. But he seems to have taken that on board. At the start, they were certain things like the search function can only do this, it was very hard to import. I guess the biggest thing I have with Asset C from an analyst and a data sort of view is in fact that anyone can import. So I don't really like losing that control over my asset register. Someone that has been there a week and just out of university accidentally pushes the wrong bottom and could potentially wipe out all of my data. That is my biggest thing about Asset C. I know there is permissions know to stop that. See this is why I don't want to go into the problems because I think they already fixed some of them.

Interviewer 1: As you say, it is kind of a moving window. Don't worry we are not going to quote you on that specific short come with the software. But it is interesting to get your perspective. That is all. Is there anything else that we haven't asked you on the Asset C side? Oh yes you said you have not been involved in the development, but what is your understanding about where

did it come from? I mean you mentioned Hussein several times.

Respondent: I believe there is sort of knowledge within the industry that tools are valuable. And I have seen Add Energy's previous attempts at them. And then we have taken the previous attempts and learned what we have from building them. And then went with the code based software which is something that definitely improves it. Makes it harder for people to access. Whereas before you could train anyone and sort of give access to them. They sometimes used excel VBA, which is probably an industry thing. The oil industry works in an older industry. But the code based software is definitely better. You can work from an address and use it anywhere in the world. Trying to be on VPN while you are in Tbilisi, Georgia is not very good. So I always use the connection that runs faster. You know I don't have to worry about losing data or disconnection and that sort of stuff. Sitting in a client's office in Tbilisi Georgia, one time I had to make a copy then update my copy back in the old data access base every day and it was a complete nightmare. So that fact that I don't have to do that is a lot better now.

Interviewer 1: Is there anything else that we should have asked you about asset registers in general? You know when we were asking about quality and that sort of thing. Is there anything you want to tell us about that?

Respondent: The thing I have with asset registers is they are not done consistently. I would love someone to come into the industry and standardize the tagging philosophy. So that I know that every PG is a pressure gage. And sometimes it is not. Or PT is a pressure transmitter and sometimes it is power turbine. [Laughs]. Sometimes you think you know what you are doing and then no actually this client does it in a different way. Even

within a client based who bought something from somewhere, a previous version, there is no quick way to be able to analyse all that data and kind of pull it in. Even sort of object types. Sometimes they apply it differently. Some people got their own object types. Trying to do mapping is a unique thing. If we can build that into Asset C that would be great. We can have a sort of that is the Add Energy object type. Here is what it was applied to on project A. Add energy criticality would be harder to do because it is more specific to clients. But I thing with the object types we can probably standardize Add Energy format. And then roll out of there. And this will be the case for the next query, changing it from our external code to our internal code. Our internal code will then cover maintenance. If you had pressure transmitter type A would get type A maintenance applied to it at the back end. That will be very helpful. I think this is something we can do with Asset C. for me the asset register is the basis of good maintenance. If you don't have a complete asset register you can't maintain all the equipment. So if you are missing an equipment, and it is not on your asset register, okay you say are maintaining it. But what is to say that the guy went it to do that, but he didn't actually. So complete asset register to me is important.

Interviewer 1: Yeah. And you are spelling out why. Because if you don't have a complete asset register you are not sure that everything is being maintained properly.

Respondent: And I am not sure that if we will ever be able to get to a point, well you probably could but is not financially viable, to make sure you have 100% complete asset register. This is case going to the extreme and I don't think this is necessary. You might need to put every fence that you have on the site individually. You can just put fences and then tag them that there are no holes in them. So come down to the point, where

it becomes silly to put stuff in. and every client or operator has their own ideas about that.

Interviewer 1: And you mentioned that you are going to start using Asset C on Monday I think. Could you tell us a bit more about this project? Who is the client? And what is the project?

Respondent: So, it is Shell client. We are doing an asset register rebuild. So currently we are doing what we discussed before about the tags extraction from the PNIDs. Noe if you can get something that extracts straight from the PNID and tells us exactly, like extracts all the facts and PNIDs and puts it in Asset C that would be amazing. [Laughs]. So we are currently doing the extractions in excel, doing all sorts of formulas and concatenations. Then we are starting off with a small sample of that on Asset C on Monday I believe. And then we are going to build the hierarchy from there on Monday. And that gives us the sort of solid place to start the data rather than spreadsheets.

Interviewer 1: And which part of Shell? Where are they based?

Respondent: That is Nigeria.

Interviewer 1: What does PNID mean?

Respondent: Piping and instrumentational diagram.

Interviewer 1: Okay, thank you.

Respondent: This is the main one that we focus on for equipment. But there is other diagrams: data semantics, single lane diagram and you have got so many different drawing. But for our main line for equipment we use PNID.

Interviewer 1: Scarlet, were you indicating you were happy?

Interviewer 2: Yeah, I'm happy.

Interviewer 1: Okay so I think we are going to wrap up. Thank you. Can I just ask you a few sort of bits? I think you gave us this earlier. Can you please say your name for the recording?

Respondent: [Redacted: respondent name]

Interviewer 1: What is your title?

Respondent: Data Analyst

Interviewer 1: How long have been working in Add Energy?

Respondent: 4 years

Interviewer 1: And I think you said that you went from university to Add Energy. So you have been working in the industry for 4 years I think?

Respondent: Yes

Interviewer 1: Thank you so much

\*END AUDIO\*