Subsea Well Response Readiness Evolution Webinar Transcript

Andy Myers: [00:00:00] Good afternoon, good evening, good morning. Uh, my name's Andy Myers. I am the Subsea Director, or subsid, well intervention service Director for O S R L. So I look on, look after the, the subsea services, which include the Swiss services and the Sprague service, which is ringfence to the uk. CS on behalf of our members.

Um, you've got the pleasure of spending an hour with me today talking through this presentation, which is around. Sub well, response, readiness, evolution. Uh, I'll just pass over to George to do a brief introduction, George Stead, who's joining me today, and then we'll start the working through the content.

George, over to you.

George Stead: Yep. Hi everyone. My name's George Stead. I'm a technical Cons consultant with O S rl. Um, formerly I was with BP and I was responsible for source control planning in various regions, including Australia, north Sea, west Africa, [00:01:00] Canada, and Trini.

Andy Myers: Excellent. Thanks George. Well, we'll start getting going.

So the purpose of the, the presentation today, the webinar today is really to provide useful information and considerations to you as attendees for preparing for and responding to a subsid well incident. Um, how our services have evolved to meet the industry guidance, um, and that will include evolution of equipment.

And the service provisions themselves at various points during the, the presentation material, we will refer to, uh, io g p documentation, uh, io g p are a key stakeholder of of O S R L, and there are at least three very important documents related to sub c. Well response, there's 5 94, which is around source control, emergency response planning.

Guidance 5 92, which is response time, modeling [00:02:00] guidance, and 5 91, which is around painting incompetency for the source control branch. So we'll start moving through the content. There are those two introductory slides prior to the, you know, basically an overview of the agenda. Uh, and then we will roll on from there.

Hopefully the slides change. Does that work for you, George? Can you see that, where that slide's moved? Yep. Okay. So just as a, an introduction, two slides to start with. First one is, uh, related to, uh, O S R L, who we are, just in case anyone who's attending the webinar, uh, doesn't know about us. Um, we are, uh, the largest international industry funded, uh, oil spill response, uh, cooperative.

We're owned by the majority of oil and gas producers and transportation companies globally. We have trained, uh, and we are ready with, with personnel trained in response to effectively respond anywhere, uh, in the world. Um, our [00:03:00] members are our shareholders. Um, our shareholder is not for, for profit purposes, and we truly operate as a, a membership type arrangement.

You'll note there on the, on the left, the bottom picture. Um, that shows a, a piece of the subsea equipment that we'll be talking about more through this webinar. Uh, and the, the subsea services are offered as supplementary services to meet your, uh, operational needs under the banner of the overall, uh, O S R L, uh, membership for, uh, traditional surface, uh, response and, uh, incident management.

So that's an intro about O S R L.

The inception of the Subsea services, um, was after Macondo Monta, uh, and other significant industry events. Uh, industry representatives came together under the banner of I O G P and created what was called the ger or the Global Incident Response Group. The GER was inter [00:04:00] industry coming together to set the guidelines, uh, and basis.

The joint industry project called the Sub Sea Well Response Project. Uh, the services that we have as our supplementary services focused on, uh, subsid well response are a direct result of that project, um, with the pretext that it was, the, the long lead items that would be required to res to respond to a subsid well incident.

Um, and the, the seed, basically the inception of the services to provide a, a different additional support, uh, within, um, within the membership of, of the subsea service. So the key equipment that was delivered, uh, the first phase of the, of the, uh, from this work project was delivered in, uh, 2012, and that was the capping stacks.

There are four capping stacks within the, uh, O S R L uh, subsea services, one in Brazil, one in Norway, one in South Africa. And one in Singapore. Uh, [00:05:00] all of them are 15 pay rated, excluding the, uh, South Africa capping

stack. Um, the Brazil and the Norway capping stack are, are b o p ram based systems. Um, and South Africa and Singapore are valve based systems, but we'll talk a bit more about that.

So the capping stacks were the first phase of the project and in conjunction with that first phase was the sub subsea incident response toolkit that came slightly later, roughly. 2013. Um, and the subsequent incident response toolkit is really the first strike package. It's Oceaneering equipment and it's located in Brazil, uh, and Norway.

Again, we'll provide some more, uh, details around the, the equipment as we roll through this, uh, this, this webinar. The next phase of the, of the project was the contain. System and that service came into, uh, inception in 2015. Uh, and the containment system is the [00:06:00] only, uh, part or services that have assets, which are not directly air freight.

Um, and we'll, we'll talk about more around the, the system that pulls together under the containment banner. But essentially the, the large, uh, flexibles, if you think about production flexibles, uh, due to the minimum benra, it's not possible for them to be. Uh, air freighted within, uh, you know, globally. So those are located within Brazil, within uk, uh, and Singapore.

The containment system is, is predominantly the top sides is located in the uk and the sub-sea equipment is located, uh, in the States. So a really, a truly global spread for the containment. The final phase of the SW project was the offset installation equipment. Uh, again, we'll go into that in more detail, but this is equipment for where it, where it is, uh, not, uh, possible to get vertical access above the wellhead, uh, to be able to intervene.

Um, and this equipment is, uh, [00:07:00] was developed by Cype and is stored in Trita in Italy. That's the, uh, the light. Um, dot on the, on the map. As we've, uh, progressed through the service, various other pieces of equipment have come into our inventory. We now have water column monitoring equipment, which is located in Houston.

Um, the Dispersant delivery system, again, which is located in Houston. And again, we'll talk more in detail around those assets. As we move through this presentation. You'll note that there's a, the, the purple, um, which is the air. Capping stack. Uh, we developed in 2018, uh, dedicated transportation skids for the Norway and the Singapore capping stack, uh, for, uh, direct air freight, um, without, with very minor disassembly, just the jewelry being, uh, removed off the capping stack.

So essentially in one piece, uh, in an a n 1 24, uh, airframe. Um, so again, that's additional capability [00:08:00] that's been developed over. So that really kind of sets the scene of, of inception and some of the, uh, hardware developments that we've had, um, over the last, uh, few years. So, looking at the agenda, what we're going to be focused on talking about today, it's, you know, those familiar with this.

We're looking at both sides of the, of the, of the bow tie here with clearly the incident. Uh, in the middle we are focusing. Preparing for the unlikely, but potentially very high consequence event of a subs well incident. And then on the other side, re responding to that event. Uh, if we look at the. Um, prepare side.

We'll be giving some guidance around the source control emergency response plans and the considerations for those logistics elements. Talking about vessel strategy for response, uh, and then importantly around training, um, uh, and [00:09:00] exercising and tools that we've developed in order to be able to help support our members in that regard.

And on the right side with regards to response. We'll be giving a good overview of the equipment, um, and then other framework agreements that we have within the services, um, uniquely, uh, mutual aid, um, for personnel, specialist personnel, uh, and of course the, uh, the Global Subsea Response Network. And we'll talk about how those partners that, that, that, that, uh, work with us in, in that network, how we bring all that.

And your note at the bottom, it will conclude basically with a, uh, you know, a membership overview of how that is, is, is offered to our members. So anything you wanna add, George, on the agenda

George Stead: before we rolling? No, I think that's quite extensive. Thank you.

Andy Myers: Okay, so starting then with response, we wanted to start on, on the right side and then we'll focus in, uh, towards the end [00:10:00] of the presentation with regards to Prepar.

Uh, for, uh, for a sub well, response and considerations. So looking at the initial activities, if we, um, the way we've set this presentation up is really we're trying to, to give you an indication around the, the activities in a sequence, logical sequence of events. And so clearly, Uh, planning for the initial response activities and making sure that everything is in place, uh, is, is, is critical.

Um, uh, an effective response clearly is that the, the source is controlled, um, within the shortest period of time possible. So if we look at the, the equipment on the response side that we have within the, uh, equipment inventory, in order to be able to help in that regard, we have the, the cert equipment or sub-sea incidents response targets.

These are the, uh, oceaneering or the o e em with this equipment. They're the items which are stored in Brazil and Norway, and that [00:11:00] equipment is split into essentially three, uh, modules. They're all containerized, uh, stored, maintained fully response ready, containerized for rapid global mobilization, but ultimately in three packages within that I.

So this is, and this is really thinking about response strategies. And the cert equipment provides enablers for the subsequent missions. So in the event of a subsid well, uh, incident, um, the first, um, mission that will be attempted and should be planned for is related to the b o p, uh, potentially b o P. Um, so clearly you've had, uh, issues, challenges, um, and the first, uh, attempt, if this is obviously it's incident specific, uh, but would be in a logical sequence, would be to potentially intervene on the existing b o p to try and close that, uh, and therefore address, um, the source.[00:12:00]

We have, uh, a bunch of equipment in, in the, uh, inventory. Uh, we have the, the skids, which can be run under our ROVs in order to be able to provide, uh, the high product capacity to, to, uh, shut the, the P o P Rams. Uh, and also we have, uh, subsea accumulator modules, which through Manifolding can provide the same, uh, ability.

So the equipment, the subsea, Uh, to be able to, to complete those missions. Just to be clear, we don't have the ROVs, um, within the, within the service that's considered as a well owner equipment, um, a a and as we go through this presentation, there'll be, uh, a number of elements which are well incident owner equipment that need to be planned for.

So the first, uh, approach would be b o P intervention. Um, there were clearly then this would follow with regards to site survey, uh, and debris clearance. Again, we hold the, uh, R A V tooling, um, and, [00:13:00] um, we hold medium to light, uh, debris clearance equipment currently. So the types of grappling hooks, um, uh, cutters, uh, grinders, uh, et cetera.

Which could potentially be used to remove, uh, debris and, and clear the site in advance of. The capping missions and the final part is really around sub-sea dispersion application. Uh, sub-sea dispersant application could be a key

enabler to be able to permit, um, while capping, uh, on, on the well, and with regards to subsea dis dispersion application.

We have the, uh, the, the subsea elements within the cert equipment, the oceaneering equipment, which are the hydraulic flying leads, uh, the wands, again, some manifolding, and the, uh, coiled, uh, tubing, termination heads. Um, but we also have, uh, complimentary equipment, as you can see here in the bottom right on the slide, which is the, uh, the d d s or DISPERSANT delivery system.

And I'll talk more about that and George and I [00:14:00] will talk more about that in a few minutes. But the point being, the cert, the cert package is really to hopefully be able to, uh, address the issue with B O P intervention. If not, then provide the, uh, the, the enabling missions, uh, to be able to promote capping, uh, of the.

Anything you wanna add? Nope. All good so far, Andy? I, I'll, I'll leave you to jump in if there is anything. Um, so, uh, looking at b o p intervention in more detail, clearly as I said, this is unlikely event that the rig fails to close the b o p and emergency b o p intervention is therefore required. So it's the R O v mounted intervention skids sub accumulation.

B o p intervention, manifolding. And, and what we also have within the, within the inventory in Norway, we have a nitrogen charge kit. Um, and in Brazil we have a nitrogen gen generator such that we can rapidly recharge or charge the, uh, subsea accumulator modules prior to, uh, to, [00:15:00] uh, mobilization.

The next, uh, piece of equipment as I, I gave an intro to was really around site survey and debris clearance. So say toolkit contains various tools, removing debris, it's all more lighter, medium weight intervention equipment. So, uh, grappling, butting. Um, et cetera, and of course, importantly, 2D, 3D sonar tooling to be able to understand and potentially map out, uh, the, the, the, well, uh, the well status.

So moving into Subsea dispersant application, um, we have two complimentary, uh, pieces of equipment, uh, and services which come together. In the event of a, of a, of being required for a response, our focus first in on the, uh, dispersion delivery system. So the dispersion delivery system is, is shown here on the left.

[00:16:00] With regards to the, the system that that can be, can be mobilized by if required. And this system includes, uh, the downline, so the downline hose, top sides pumping, um, and, uh, additional complimentary ancillaries, uh, which

will work with the existing cert equipment in order to be able to provide a, uh, a full, uh, capability to, to, for the dispersant to be deployed to succeed.

Uh, alternatively of course, you could use a configuration with core tubing. We don't have the core tubing or core core tubing units within our inventory, but the cert equipment is designed to be able to, uh, be compatible and, again, complete a a similar system. So there's really two kind of options here.

The d d s system was designed. To, uh, to be air freight globally and stored in Houston and containerized and the reels with the hose, um, are air freight within, uh, 7 47 aircraft.

George Stead: Now, I guess the [00:17:00] key message there, Andy, is that O S R L opposition to give all the equipment required for, uh, uh, subsided dispersion application with the exception of the vessel, um, and the dispersant itself been available through a separate agree.

Andy Myers: Correct. Um, so we'll get to an end of how it all comes together. But yeah, it's, we are essentially here closing the loop so you have, uh, the ability to access the services and, and equipment for Sub-sea, this person application. Another important element of that is of course, water column monitoring. And again, we have the associated equipment for that service and access to the associated scientists, uh, in order to be able to.

Those services. So a again, it's all stored containerized in Houston, ready for rapid global mobilization. And the system is essentially a downline wire with a rosette. And then, uh, you know, laboratories that can be run on the back deck of the deck [00:18:00] of the vessels of opportunity. Um, and it's stored in, let's say stored in Houston, maintained by csa who are the, uh, OEM of the equipment.

Uh, so ready for rapid mobilization global.

So we've now been through the initial response activities, which as I said was potentially b o P intervention. Then looking at the site, uh, potentially debris removal if that's required, and subsidy dispersing application. These activities are the enablers in order to be able to. Potentially clap. Cap. Cap.

Well, if that is required, and the primary source control devices in that regard are the capping stacks. As I said at the start, we have four of those within the stockpile. One in Brazil, one in Norway, one in Singapore, one in South Africa. Three of them, 15 K, one 10 K. The 10 K is South Africa. Two of the capping

stacks, as I've noted, were, uh, rapidly air freight in a and 1 24 [00:19:00] aircraft.

You can see that picture on the, uh, on the right, and there's a short video and a, and a couple of slides time, uh, which, which shows the mobilization exercise we completed in, uh, 2018 in that regard, as you can see this, the, uh, the cap on the, on the left. Um, our capping stacks, I say the four that we have within the inventory currently are all, um, uh, based on the same, uh, principles, um, and the same framework.

So we have, uh, the, the main thing that changes between them is the central boar and the main isolation. Uh, so if you're looking on the, on the left, the Singapore and the South Africa, uh, caps, as I indicated, a 7 0 1 16th inch. 10 K in, in the case of South Africa, or 15 k in the case of, uh, Singapore valve based solution.

Um, and the Brazil and the Norway stacks are 18 and three quarter inch, 15 K rated ram based systems. N O v Rams. But the point is, is that there's redundancy in the service. And membership provides you [00:20:00] access to primary and secondary. So, uh, a, it's a first and second two out of the four capping stacks that we, uh, that we have on offer globally at the, the member's discretion.

Uh, but if there was further redundancy that was required, they're all built on the same framework structure and, and pipe work outside of the, uh, of the main ball.

So the next slide should have a video if I roll onto that. Um, and that will give a, an overview of a mobilization exercise we completed in, uh, I think it was the end of 2018, if I remember correctly. Uh, where we, we moved the, uh, Norway capping stack, which is the one of the large 15 K stacks, uh, to the airport, loaded it in an A and 1 24 airframe, um, and completed a test flight.

So I'll just move on to that.[00:21:00]

So, as I say, that was a mobilization, uh, [00:22:00] uh, trial, really full scale, um, mobilization, um, We completed in, uh, in 2018. And just to confirm, the capping stack was in the, the aircraft when it took off there with that footage. Um, rolling on then to, uh, to further equipment, which, which supplements capping missions if required.

I spoke about it at the start that the final, uh, phase of the, uh, subsid well response project was the offset installation. Now the, the offset installation equipment, um, is required where vertical access may not be be possible. So in previous, uh, you know, when we've been talking about the enabling missions and potentially running capping stack, and we'll talk more about considerations for that later on, uh, you're essentially assuming that you can have vertical access above the wellhead and you could use a, uh, a, uh, a standard.

You know, offshore deployment vessel, um, in order to be able to run the equipment, um, where that is not possible and you, you cannot get, [00:23:00] uh, a vertical access. Uh, the SW project developed a, uh, as a system, uh, which was the offset installation equipment, um, for exactly that scenario. And what the offset installation equipment, uh, provides is the ability to be able to lift the capping stack sub-sea from a safe offset in order to be able to, uh, protect people and assets, uh, working outside of an exclusion zone.

The premise of the. Of the project was that there would be a 500 meter radius exclusion zone around the w the incident. Well, um, and as I say, the, the missions then what we've been talking about previously, capping deployment and, and installation, et cetera, would be completed from that safe offset. Uh, the, the system was developed in order to be able to, uh, to lift the capping stack sub sea.

So you can see here it's approximately 150 ton capacity. But also articulate the capping stack of full 360 degrees. So there is a, uh, a carden joint, and there's a subsequent slide, which I [00:24:00] can talk through in more detail. But there's a carden joint that provides this capability, including being able to accommodate potentially mal wellhead misalignment.

The, uh, carbon joint also provides for the soft landing capability. Clearly it's important, uh, to consider, uh, the status of the ceiling faces as the capping stack is brought into the, uh, into the capping interface point. Uh, and then designed for, you know, up to high ga, high gas flow rate wells, um, with regards to its capability.

If you look at the main component of the O I e, uh, system, uh, it's actually the, uh, the O I E carrier. You can see in the, in the red circle, that's a capping stack. Um, and you can see here the, the mainframe. Including the card joint, which is in the middle. Um, you can also see the four buoyancy tanks, which are connected to the, uh, to the frame, which provides the ability to be able to lift the equipment.

Subsea, uh, the, the weight of this carrier is about 236 tons in air, so that needs to be considered with [00:25:00] regards to. Mobilization and planning. Um, and it's obviously quite large if you look at it here, 13 meters by 10, by 13. Uh, but it's, uh, it was a, a significant r and d project, uh, by, uh, the swp. Um, and that was delivered in, in, in 2018.

Just a, I can see there's a, a, a, a number of questions coming into the, um, into the chat. What we'll do is we'll address those questions, um, at the. Um, uh, but when we get to the end of these, of the slides, So just to summarize the initial response, um, how everything comes together. So you can see here, uh, the big green, uh, box, that's the, the capping services.

And within that you have the, the cert services or the, in the blue, the light blue, and that has the three supporting packages for the initial response. Uh, there's complimentary equipment within the capping, uh, services with regards to the d d s and the water column monitoring as I spoke about. [00:26:00] The capping stacks and potentially o i e if that's required.

If vertical access is not possible, you'll note off to the left. It's not, uh, integrated into the sub-sea services. But there is a O S R L have a, a separate supplementary service agreement, uh, which is the global Dispersant stockpile, um, which, uh, you know, you can potentially get access to as well. And again, that provides therefore the, the dispersant for subsi, uh, applic.

So that's the, that's the, uh, the end of the first part with regards to the initial response and initial considerations. Moving on to supplementary, uh, options for scenarios where it's not possible. To be able to shut in the, well, uh, the SWT project as in the, the, the, uh, the second phase of the project, uh, developed a solution again, based on the principles of providing the long lead items to, uh, to put in place globally the [00:27:00] potential for a, essentially think about it like a pilot production system to be able to.

Uh, the, uh, the, the, the fluids to surface, uh, for onward processing, uh, and offloading. Uh, we don't have, uh, if you look in this diagram here, clearly we don't have the, uh, you know, the vessels associated with this, uh, or quite a lot of the other equipment. But we do have within the, the services, uh, a lot of the top sides equipment.

Uh, so the coolers. Pumps, uh, incinerator pumps equipment, um, and we have the subsid, importantly the subsea, uh, infrastructure as well, which includes subsea flow lines, uh, flow line, inter termination units, um, riser bases, um, and, um, uh, other equipment to be able to, to pull this together. It's also has the,

uh, the chemical, uh, system as well, potentially for flow assurance considerations.

Um, so we have, um, a chemical distribution system as well. Clearly if, if [00:28:00] you are getting into the containment scenario and capping has not been successful, um, this is, uh, you know, a will require significant engineering. And really from a point of view of, um, of guidance, it's, this is a down to members, uh, really discretion around how far, uh, pre-planning is for containment.

Anything you want to add to containment, George?

George Stead: Just hopefully you'll never need it. Cause there's a very, very complex undertaking.

Andy Myers: I couldn't, I couldn't agree more. So that's really, we've now walk, walked our way through all of the equipment on the response side. Uh, and now we're gonna talk a little bit more around, uh, additional service provisions prior to, uh, to talking about the, the preparation, which is really where we all need to be focused.

So this is an introduction to how we can facilitate, uh, an integrated response. One of the elements, uh, and and we are uniquely, uh, at our framework of [00:29:00] membership actually, uh, is, is pretty unique in this regard in, in, in allowing us, uh, the ability to be able to provide mutual aid. So we have a, an existing mutual aid framework agreement for personnel, um, under the, uh, the sub c uh, membership agreements.

And it is, uh, essentially the, the framework that permits, um, the potential for sharing of resources, um, focused in this, in this case, around source control branch, uh, in the event of a response. And that's important for particularly for, um, you know, considerations of a sustained response. This is something that has been very well.

Received, uh, globally by regulators, et cetera. Um, and I'm pleased to to, to say that all of the, the long-term members are participating within that agreement in the event of a, of a, uh, mobilization of O S R L participant in the Mutual aid framework agreement can request, uh, that this is triggered. An O S R L help [00:30:00] facilitate that by provid.

A, uh, agreed to comedy terms between participants, uh, but also the points of contact between the companies, uh, in order to be able to, uh, to kick off mutual

aid personnel. So as we roll on later into the presentation, talking around preparation, and we talk about the incident management team, et cetera, focusing specifically on the source control branch, then mutual aid is clearly, uh, an important consideration for the personnel and the personnel you may need for a sustained response.

Talking a little bit around the, the, the reason for the, the global subside response network prior to, to talking about who's actually participating in it, but O S R L facilitate the Global Subside Response Network, um, to be able to provide access to all of the expertise. Uh, both for planning, which we can, uh, provide directly through ourselves or in a response.

So these, uh, these participants have, uh, agreements which can be used potentially by the [00:31:00] well incident owner to provide that, that, uh, that comprehensive response. Um, the, the, the point being that, you know, the risk of a major well control event, it's not changed. Potentially the impacts are. Clearly there's a lot of focus, um, and the need for mitigations is stronger.

And what the G S R N delivers is the mitigating enablers through preparation, planning, exercising, and responding to basically bring everyone together, uh, to, to collaborate.

And we've worked up these agreements, um, as part of our, our Swiss ecosystem, if you want to call it that. Our subsidy services, the wider, uh, context of the global Subsidy Response network, and the, and the current participants are ADC energies. So, so with a focus on rig audit and inspections that may be required to support, um, relief, well missions we have, uh, ad energy as well controlled specialists, Burling logistics support, [00:32:00] C S A, who are the o e em of the water column monitoring equipment.

This provides access to the water column monitoring, um, services, the associated scientists, et cetera, Genesis and in who are both technique FMC companies who, uh, we have access. Te fmc, uh, Neptune who are m a offshore, again, a, uh, engineering consultancy and fabricator based in Aberdeen Oceaneering, who are the OEM of the CERT equipment, cipm, who are the OEM of the offset installation equipment.

Te fmc, who obviously are globally recognized installation and APC contractor. Clarkson's the largest, uh, ship broker in the world. And MarTech the division of technology, uh, Sian. Who are the OEM of the dispersion delivery system. Trendsetter, who are OEM of the capping stacks would again, globally recognized E P C contractor.

And they were actually the systems engineer [00:33:00] for the SW project, bringing everything together. And then of course, while well control who are key strategic partner of ours, uh, with regards to, to source control. So you can see here a, a comprehensive network of part. We'll touch on it a bit la later. Uh, but we, we are focused on exercising and bringing these, uh, participants together.

Back at the beginning of last month, we completed a, a, an exercise in Houston focused on capping deployment and brought together Clarkson's. Technique FMC while well control and trendsetter in order to be able to work through procedures, which we, we'd have developed by technique fmc, um, and the roles and responsibilities through the deployment of the capping stack.

So really trying to develop this and formalize it moving forward to provide that support to our our members. So now focusing in on, on, on preparations, um, and I'll certainly be referring more to [00:34:00] yourself here, George. Um, but on the preparation side of things, as I said at the start, we're looking at the planning, uh, what's considered in the, in the source control, emergency response plans, logistics plans, vessel strategy, and then importantly training.

Uh, so your incident command system awareness. Swap, which we'll talk about. And we have an overview video of that, which is our, our subsid well awareness portal or training portal, which is part of our membership. And then of course, exercise support,

looking at the contents of a, uh, overall, of a, of a scope, uh, and what's involved in that. Of any key, key aspects. And, and that said at the start, the, the key guidance here is really IO G P 5 94. Uh, that's something that we can, we can, we have, provide access to through our website, but can share as part of the outcome of this, um, uh, this meeting as well.

But if you look through the content here of a typical source control, [00:35:00] Plan. Um, it focuses in both on the incident management structure, um, the roles that will be provided with regards to source control. It talks about rele relief, well planning, it talks about plume study and then, uh, the potential for capping interactions with that.

So landing analysis. It talks about subsea dispersant planning. It talks about, uh, interfaces with regards to the capping stack, which may be a B O P wellhead, low marine pack, et cetera. Um, and, you know, capping stack selection and thinking around through available connectors and ensuring that the planning is in place in order to be able to, to, uh, interface, um, according to plan.

A key element is the logistics element, and again, we will touch more on that. Uh, on subsequent slides, perhaps George, to gimme a break from talking. I'll pass over to you for the, for the next couple of slides and we'll go from there.

George Stead: Okay. Um, well, as part [00:36:00] of your, um, source control and emergency response plan, one of the key validations you would require to do is confirming what connector you would need on the bottom of the capping stack. This is key information that O S L needs to be able to configure it for the mobilization. Um, so again, your ca plans would normally.

Specify what potential capping interface points you have on your will. So there's primarily three potential points. One could be the top of the L M R P, and we do have, um, riser adapters and izing tools to facilitate that interface point as well in the inventory. Um, another point in probably the. The most desirable point would be the top of the lower B O P with the L M R P removed.

And lastly, another potential interface point would be the wellhead with the complete B o P removed. So again, your capping plan should ideally be exploring those three. Um, Options and documenting what specific connector you would need for each of those [00:37:00] scenarios within your plans. And again, doing this stuff in the planning phase helps us in the response phase because O S R L can then configure the cap accordingly to your needs.

Andy Myers: And, and what I'd, what I'd add is that we, you know, we are, this is an area of focus, uh, within the, the members to look at, um, you know, in increasing the, uh, connectors that we hold within our stockpile currently globally, we have. H c h four connectors at each of the bases. We have HC connectors at each of the bases, and we have an EBI F, uh, in, in Houston, and we're looking to, uh, to grow that with, uh, an additional EBI F this year.

Uh, an additional 10 K HC this year and rolling into next year. Um, uh, DX 10 as well. We've just had a DX 10, uh, introduced into the, I. About a month ago. Um, so this is an area that we are, that we are looking at, um, and, and focused on really around trying to make sure that the, the service is comprehensive with regards to this, this [00:38:00] interface.

And as joy as, as George points out, this is a critical thing to make sure that all the planning is in place helps us, um, to be able to get the equipment ready for you. Um, but also it means that you are prepared.

Next slide. George, you okay to take this?

George Stead: Yeah. Uh, I guess another key validation is can you land a cap onto your will? And with most of the. Two of the O S R L caps are full bore 18 and three quarter caps, and therefore there should be no issues of landing them. Two of the caps are smaller board diameter and they are subject to more uplift forces.

Um, so there is, uh, an initial screening tool that's available through O S R L and that's purely for initial screening only. Um, so that will assess the. The discharge figures coming from your will, the uplift of that exerts on the capping site, and confirm whether we can land the capping site with those uplift forces.

Um, if there's any ambiguity on that or [00:39:00] any concerns, then we would recommend you use one of the g s Rrn partners to, to do some well specific, um, C F D analysis to confirm your cup. But again, this, this is mostly applicable when you're looking at the, the small board capping sites as opposed to the 18th three quarter flow boar.

You.

Andy Myers: Classic. Um, as I, as I spoke about when we, when I was giving a run through of the, uh, what's included within the contents of a source control emergency response plan, one of the, what the critical element is regards to response time modeling, um, and. You know, we have the expertise to help develop these. Um, clearly we have a defined, um, response time that we are, that we're working to in the event of our mobilization.

Um, but we are here to help in, in that regard and trying to understand with regards to how all the equipment comes together. And the [00:40:00] necessary resources that you will need in order to be able to, to, you know, expedite the response is, is really key to understand that in advance. So you'll be thinking about, you know, whether or not you need to be air freight or is, is seize transportation, that, that, the most likely and best solution, et cetera, and considering risk in that too.

We can obviously have access our G S R M partners, uh, to help support these activities. Uh, and Burling are obviously a, a recognized global logistics provider who again, we have a, a good relationship with. Anything you want to add on response time? George? J

George Stead: just on the air freight of the air freight capping stack.

Um, one of the key validations is can you receiving airport, um, take the AM 1 24 with the payload of the capping stack on it? And to facilitate that, what O S R L have done is we've actually engaged a, a specialist aircraft operator, um, and logistics company. To pre-identify [00:41:00] a whole host of different receiving airports and make sure that they are clear to do that, so that due diligence has already been done for a, a large number of existing

Andy Myers: airports.

Of course, that information can be, uh, evade and, and is made available to members, so,

George Stead: Thanks, George. Just, just to compliment that, Andy, on the A 1 24 availability, um, with regards to the ongoing conflicts, um, we do issue fortnightly updates on a N 1 24 availability to our subscribers as well to make sure that, um, we, we do have that capability still in the, uh, The toolbox and to compliment that if there was no a and 1 24 s available, we have refined the logistics to allow non N 1 24 air freight of the equipment and just Boeing 7 47 freight aircraft.

So all of that has been done, um, in anticipation of potentially not being able to source, uh, an a EM 1, 2 40 aircraft in the timeframes that we would be looking for.

Andy Myers: Excellent. I think that was one of [00:42:00] the questions in the chat that we can address. As we get towards the end. Thanks, George. Okay, the next slide gives an overview.

I've got a video here that gives a quick overview, uh, of the, uh, c response software. I'll just click, click play, and then go on mute.[00:43:00] [00:44:00]

Excellent. So you can see from that overview that the, the c response software, which is offered again through the membership is a digital tool. Uh, one of [00:45:00] a, a few. Digital tools that we've developed with our, our members in order to be able to support the vessel sourcing, vessel tracking, uh, and trying to really provide some intelligence, uh, was developed.

The, the OEM of this is, is Clarkson's Marek. Um, and through the agreements we have in the G S RM that also provides access to potentially through to, to Clarkson's for broing services if that's required.

So thinking more around preparing, uh, and training. Um, I M t, so incident management, uh, team training. Um, you obviously need to be thinking about the structure, um, who will be providing and, and, uh, fulfilling the various roles. Obviously we are focused here within the, with regards to source control and the source control branch, but importantly, providing people with the training and the expertise so that when, uh, you know, this unlikely, but, uh, you know, Potentially high consequence events occur that we can rapidly mobilize people to [00:46:00] work together.

And I think it's important to, to understand that you know, the source, the source control branch will. Will be part of the wider I M T, which potentially could be a significantly sized organization. Uh, so that's something to consider, uh, in the planning stage. Well in advance we've mentioned around mutual aid and how, uh, those frameworks can potentially help, um, particularly under the, the subsea, uh, banner with regards to source control, um, expertise.

But all of these considerations, Um, you know, need to be put in place in advance, uh, O S R L can provide the integrated, uh, i c s training. Um, and, and we'll talk in a minute around, um, the additional training that we can provide specific to, uh, subsea awareness, uh, as well. George, anything you want to add on this slide?

No.

George Stead: Okay. So cover, let me go through the swap portal.

Andy Myers: Okay. So I'll pass over to you for this one and I'll try and manage the video. [00:47:00]

George Stead: Okay. Just before we start the video, I guess it's fair to say a subsea source control response would be a very complex and challenging undertaking. We do have multiple resources available to enable an effective response.

Andy's already covered the resources available through O S R L. That's both the hardware and the technical services available through the A G S Rrn to complement the those. There is also a globally recognized incident management process to help structure. An emergency response on the people side. Um, that's the internet command system and OSL offers courses on that.

The I G P actually took the I C S A step further and made it specific for source control response. So within I O G P 5 91, um, for competency and skills as a, a

rather comprehensive source control grant structure, and the other can be used than a response. Another key document from I O G P, which Andy's [00:48:00] already mentioned, was the 5 94 document on source control.

So with all of these resources, um, both equipment and. Capabilities, technical capabilities and guidance. O S R L created the, the swap portal, the subsea well awareness portal to weave all these resources together, um, and to assist subscribers in equipping potential responders with a baseline knowledge of a subsea source control response, and how O S R L network of services could help in that.

So specifically the, the portal adopts the same terminology as IO G P 5 94. Um, so that's prepare in the left hand side of the bow tie and respond On the right hand side of the bow tie. Could you go further the right hand to the people section?

So again, on the. People portion. We adopted the same approach as the I [00:49:00] c s, um, and the I O G P guidance. So within each of these, um, activities under the source control branch, we've got a job description. Um, it outlines the key skills that responders should possess to fulfill that role, and also a list of initial activities that they may, may need to get involved.

So again, the terminology and structure of the portal remains consistent with I L G P 5 91. Just to avoid any confusion, want to continue and to resources.

Yes, Andy has already spoken about the resources, um, so I won't. Dwell on this too much. Um, but the resources are split into both equipment, um, which is the capping stacks and all the ancillary equipment that enables capping and the g s Rrn with regards to [00:50:00] the, um, technical services and capabilities that we have through the g s Rrn.

Um, On the G S R N side, we've got the vessel sourcing, and we didn't touch on this, Andy, but the vessel sourcing from Clarkson is not just a tool for the response phase, it's also a tool that can be used in the prepare phase. Um, so for example, you can use it for, um, As an assurance tool to demonstrate to regulators that you can actually implement the plans that you have in place without having the vessels available.

You cannot implement the plans. So it can be used as a screening tool proactively while you are commencing your operations, particularly going into the reservoir to confirm that you have the vessels that you would need to implement your plans, um, within a, a reasonable distance of your activit. Um,

also within the, uh, GS rrn we can facilitate worst case discharge modeling and also those cl um, class checks for the cap interfaces.

Um, so there's a whole suite of [00:51:00] activities can, can be done there. Andy, can you go through the, we're on prepare, so in the prepare section. This is really adapting the general available equipment and resources and making these specific for the well and region in question where our subscriber is operating.

So again, these are closely aligned with Iott B 5 94 guidance. Um, typically the. Prepare section would be divided into, it can either be three discreet plans or it can be one plan that covers all three elements. But typically it would be the secondary BLP activation that Andy mentioned with regards to the sub package.

Um, looking at, well camping. And this can be quite extensive. So the due diligence required in well capping could involve determining your potential interface points, um, your logistics planning, um, whether you can deploy subsided person. If it's a viable district response strategy for your region, [00:52:00] um, confirm if you've got vertical access over your will.

So again, you could use our G S R N partners to perform c f d improve analysis. And if you do have question marks over being able to vertical access, we could then pre-plan for, uh, an offsetting installation method as well. So the, the well capping planning section can be quite extensive. Um, sorry, onto the response section.

This is essentially taking, um, all the, the benefit and preparedness that you've spent in the, the left hand prepared section and leveraging the benefits and the response to make an effective response. So on here, we're just outlining a series of different missions. Um, that could be adopted in a typical response.

And these missions are also dovetailed with the Air Clarkson software. So when you select a mission on the software, it'll find the specific vessel that will be required to fulfill that mission. For example, um, filtering on vessels with a 400 ton crane, for [00:53:00] example, tell you to deploy the, the cap. I think that's it.

Andy Myers: Thanks, George. Just keeping going, mindful of time here. Um, so we, I think we've already, we've already spoken around this, around exercise support, so, um, but I guess the key message is, is that source control exercises are vital for building that team capability and awareness. Um, and they provide, we can provide obviously that direct support, um, to, to you.

Um, and we, we were experience in facilitating, uh, those sorts of activities and I mentioned earlier on, around the exercise we completed at the beginning of March, bringing together the the G S R M partners. Just a couple of slides to wrap up and then we will roll into the, uh, some of the questions, Christina, so thinking about membership, just want to make sure that everyone's aware around how this comes together Quite simply, there are two, uh, memberships which cover.

Uh, access to the, the global subsea, uh, [00:54:00] equipment inventory that we have and the associated, uh, uh, services as we've spoken through. Um, and we have, uh, the capping service, which brings together the the cert equipment, water column monitoring. This person delivery system, capping stacks and ancillaries, and the officer installation equipment, uh, it provides access to one out of the two certs, the, uh, the watercolor monitoring, the d d s and two out of the four capping stacks in the event of a response.

Um, so it's split. So we have all of that group together within the capping service, and then under the, The containment service. This is, uh, the, the inventory as we're speaking about with regards to essentially putting in place the, uh, the temporary pilot production system. And that's offered as the, as a separate service as required.

So q and a, Christina, um, I think there should be some questions. I think I saw coming in the chat. We've got five minutes. Um,

Christina Brearley: Um, so I, I'll just do a quick [00:55:00] apology in case I, uh, pronounce anybody's name wrong. Um, so our first question is from Mahmoud. Um, and this is in regard to the capping stack. And he's asked is total six around the world?

Um, or two of the four are a, are

Andy Myers: airable. Two of the four. So there are, we have four capping stacks currently within our, our Swiss inventory globally. We also have the SPR capping stack, which is ring fence to the UK c s, which is based in Aberdeen. But as we're talking about the Swiss services, uh, there's four capping stacks globally.

Brilliant.

Christina Brearley: Um, do you the gel, um, hope that the Anton. Aircraft will be available. And to which water depths can the capping stack be deployed?

Andy Myers: Yeah, I think George, uh, touched on what we've, we've done as far as we practically can to, to mitigate around our members' [00:56:00] understanding of availability of the, the A and one, two, uh, four aircraft, which are current obviously have been unfortunately affected by, uh, the Ukraine, uh, crisis.

But, um, so that information is available. Um, from a point of view of, with regards to the water depths, um, the capping stacks are, are, have been, um, designed for 12 and a half thousand feet or 3,810 meters, uh, water depth. Um, and

Christina Brearley: our last question is, do other organizations or companies have capping stacks in their.

Andy Myers: Yes, there are other, uh, providers that provide access to, uh, uh, to capping equipment. Uh, As I hope you can, uh, see from the, the presentation that we've, we've pulled together, um, not, uh, within the same comprehensive services as we offer. Um, and there are a number of USPS that have been highlighted throughout this, uh, with regards to how our service is offered, how our, how our members [00:57:00] can collaborate together, uh, but also with regards to specific items of equipment and service provisions that are unique to ourselves.

Uh, again, mutual aid again with regards to water con monitoring, d d s Officer installation equipment. Um, so, uh, please, uh, if, if you are interested, uh, then, then please, uh, do come and talk to us. I'm happy for my details to be shared after the meeting. Christina. Fabulous.

Christina Brearley: I will put Andy's. Uh, email address in the chat for everybody.

Um, is there any other questions from anybody? I have allowed, uh, microphones and videos in case anybody would like to ask through their

Andy Myers: mic as well.

There's a hand up from Thomas.

Yes. [00:58:00] And do you know more or less, uh, how long it takes to develop a source control emergency response plan? Um, it really depends on, on, um, uh, you know, the. The extent, but you know, from a point of view of, of the experience we have, we, we've got, uh, you know, knowledge of creating these

plans globally. So, uh, if you're operating in a specific region, we likely will have been working with one of our, our members to help.

You know, develop plans, so I can't give you a, you know, is it five days, 10 days, 15 days? Um, but you know, we, we have the experience and the knowledge to be able to do it, uh, and pull that together. So working with our partners, we can pull together a, a quality plan for you. And if you're interested, please do reach out to us.

Okay. Thank you. Thank, yes. Thank you very much.

Okay. Mindful of [00:59:00] time, I think. So I'd just like to say thank you all for, uh, taking the time to, to join us today. Um, the, the presentation material will be shared to you. We'll also share links to the uh, I O G P documentation, thanks to George for providing the support to me. Uh, and we'll draw this to a, a close.

So thanks once again. Uh, and take care everyone.