BOEM DEEPWATER GULF OF MEXICO HISTORY PROJECT
OFFSHORE ENERGY CENTER HALL OF FAME

Interviewee:	Ivar Brandt
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Place:	Houston, Texas
Interviewer:	Tyler Priest

Ethnographic preface: Ivar Brandt was raised in the suburbs of Oslo, Norway, and after university was hired in 1974 by SINTEF, a large research and development organization. There, Brandt called upon knowledge gained in nearly two years spent in the Norwegian navy, working on naval architecture. At SINTEF, Brandt helped to develop and market several sophisticated software packages used by offshore oil and gas operators for large-scale data acquisition, management, and interpretation.

TP: This is an interview with Mr. Ivar Brandt. The interviewer is Tyler Priest, September 22, 2012. We're here for the 2012 Offshore Energy Center Hall of Fame induction, and you're being honored for horizontal multiphase flow technology. Congratulations.

IB: Thank you very much.

TP: Thank you for taking the time to sit down with us. Let's start with a little background information about yourself. Where are you from and how did you get involved in this whole business?

IB: I'm from the eastern part of Norway, south of Norway, just suburban Oslo, you could say, and I went to the Technical High School, Technical University, and I graduated in industrial chemistry. I was hired by SINTEF, which is a huge, by any standard, R&D organization associated with this university.

TP: What year did you graduate?

IB: Seventy-four. I was in the navy, served eighteen months in the navy. I was doing most of that at the Norwegian Ship Research Institute, so I learned a little bit about offshore technology and did some work for the Defense Department. So I had a fairly wide background when I started with SINTEF.

TP: What does SINTEF stand for?

IB: It stands for something strange Norwegian [unclear]. [laughter] Forget about that, it's impossible. It was founded by the university—

TP: In Stavanger?

IB: In Stavanger to make professors able to do consultancy in a legal way and get it organized and make more impact on the general society than they usually do working one by one, so they organized and took care of the financial sides of it and the contractual sides of it and so on. Then they started to hire people themselves, so it grew up to a comparable size to the staff at the university.

So the oil industry came to Norway in the seventies, and the Norwegian government introduced a rule which was very good, very clever, actually. To get a concession on a Norwegian shelf, the oil companies had to bring technology to Norway in a way, so they had to pay with technology transfer.

TP: Fifty percent R&D had to be developed in Norway or something to be [unclear]?

IB: More or less, yes, and it had to be R&D in real technology transfer, not just some money. They had to involve themselves to be recognized or acknowledged. At the end of the seventies, we received visitors who were talking about multiphase flow. "We need to do something on multiphase flow." There was obviously something going on.

I was sent to a training course given by an American Thomas Gold [phonetic], and he had a software package which was called HComp [phonetic]. He worked in a company; I've forgotten the name. So I went there.

TP: He was from an oil company?

IB: No, it was some software company. I didn't understand very much of it, actually.

Then one day I was sitting in my office with the door open, and one of the managers in this Department of Chemistry came by and he looked at me and said, "You have been to a training course in Stavanger, haven't you?"

"Yes," I said.

"Come here," he said. And that was how I was recruited, actually.

"Okay," I said. I left everything and followed him, like in the gospel, you know.

TP: Who was bringing these ideas of two-phase flow?

IB: I think it was, according to my colleague, Dick Shay [phonetic] and Lee Norris. They were also on the list there, and it was a [unclear] development because Mobil had found [unclear] on the British side of the line and they also realized that it stretched into the Norwegian side, so they knocked on the door to the appropriate department and said, "We think we have a common interest here in developing this field." In those days, the multiphase flow was an issue. It had a lot of benefit. They understood that, but they didn't have the technology and definitely not the software which would justify that they could take these big steps in the offshore [unclear].

TP: What were the big problems or challenges with multiphase flow? What did you need to overcome?

IB: It is inherently intransient. That means that you cannot trust that it will flow steadily all the time. There is always a potential for sluggish flow. That means that liquid is accumulating in low points and then suddenly swept out, and you have a big chunk of liquid coming to your receiving platform with a separator, which has a limited size, and to foresee and to take this into account both in the design but also in the operations required a software package that didn't exist at the time.

TP: Just for people who may now know, when we talk about multiphase flow, we're talking about oil and gas and water [unclear].

IB: Simultaneous flow of oil and gas and water in wells and pipelines. The reservoir will usually produce all these three specimen and they will end up in the well and eventually in the pipelines. So anybody who opens a bottle of champagne or opens a bottle of beer sees the gases coming out, and sometimes you have an overflow. This is an analog process, actually. Gas and oil separate. They can also dissolve and gas can dissolve in the oil and [unclear], but then it comes out and the pressure goes down. So it's a fairly common process in nature and in industry, actually.

TP: The tradition of the industry had just separated that, at the wellhead.

IB: Yes, or as close as possible to the wellhead, absolutely. So they decided to—or let's put it this way. Exxon needed a big project in Norway to get concessions, and the guys in the [unclear] program, they heard about this and they said, "We need data for multiphase flow, large-scale data, because we have just small-scale, and there is a scaling effect here." And, okay, so it turned out that Exxon was asking for a bid on developing and running a test facility in Norway. SINTEF took the challenge and there was another consortium that joined to fight for this, and that was [unclear] in Stavanger, at that time a much smaller technical research institution in petroleum research. There was also an Institute for [unclear] involved in this.

So they formed one group, and SINTEF worked together with [unclear], technical university. Now it's called NTNU [phonetic]. You will probably find it on the Internet. And after some political wrestling and talking, SINTEF, of course, our managing director had more clout in the department and industry than the other group, so it was decided to build it in Stavanger after a while.

So the group that had been working with developing the project and the proposal and everything more or less followed the [unclear] program to build this facility in Stavanger.

TP: What program?

IB: This project to build a facility. So at that time I was responsible for the data acquisition and measurement systems. But I had [unclear] who should have been here, I guess also a—what do you call them? A pioneer.

TP: Yes.

IB: But he couldn't come.

TP: [unclear]?

IB: [unclear], from MIT, as the other guys. So [unclear], he laid the foundation for the design and the parameters, etc., etc., because he had been working with this in small-scale, in refrigeration, where you have the same problem. You have gas and liquid separating. The heat transfer and so on is depending on how this is happening and what kind of separation factor you have, how much gas and how much liquid and so on. So he knew this very well from that point of view, and he had been working with tubes like this and now we were going up to tubes like this, 18-inch, which there is a scaling factor in there and the pressure level would be much higher.

But anyway, we constructed this facility and we run it for a year, for Exxon. Exxon had recruited some other companies to share the cost, including Statoil, Mobil, and Getty Oil, PetroCanada. Yes, I guess that was most of them. And Conoco. I have to remember Conoco, yes. So we ran the experiments. They paid. We had a lot of data. Then Exxon came and said, "We need a software package. Can you guys make a software package?" And [unclear], who could have started all this, "No, why should I do that? Because IFE [phonetic] has already done it." IFE had started to get with Statoil, so it was actually Statoil that was pulling the strings. Statoil was also part of the financing group.

TP: The software package was called—what was it called?

IB: OLGA [phonetic]. So IFE had already developed OLGA to some extent, and we went on to [unclear], and we had a nice meeting with IFE. We had a good dinner. We agreed on the train back that, yeah, we'd go for OLGA. And that was it. So we sent a message to Exxon and said, "We think that we should cooperate with IFE and they have already a program that is appropriate that will do what you need, more or less, and carry on with the development in a joint effort between SINTEF and IFE." And that lasted until about 1994, with various supporters and so on. The French companies came in. We had Agip in Italy came in. The company that didn't join was actually BP. They had some U.K. things going on. But we had most of the majors joining this development.

Then Statoil again came and said, "We want a commercial product. We want this to become a tool that is available to everybody because we need that our consultants are doing the same calculations with the same tool, and we don't mind if any other companies, oil companies can also use it. So please find a way to make this commercial."

So we started discussing. IFE and SINTEF started. Me and Bendix [phonetic] discussed should we jump out to the institutions and start a small company. No, we didn't. I had a lot of obligations in Stavanger. I could move south and had to go down to Oslo to start this. But then there was a company called Scan Power [phonetic], which was involved with petroleum software but also nuclear power and safety, an electronics business. They had already hired

one of the guys from IFE, [unclear], who is also one of the pioneers here, is sitting out there.

SINTEF at the time got the question, "Are you willing to let Scan Power get a license to market and further develop this program?" And after some—okay, we agreed with that. So the end of that story was that Scan Power actually got a marketing license and started building up stuff to do that job.

I was hired by Scan Power in 1996, after a year in Italy, with [unclear], and from then on I have been working with OLGA as a software package, as a consultant and also very much a trainer. I've been training people all over the world to use it. It requires a lot of training. It's quite sophisticated software. Now I'm product manager for OLGA in the sense that I'm in a group of people who are saying yes, no, yes, yes, no to the developers, and that's a very, very difficult job.

TP: So it's very sophisticated software that continues to be developed.

IB: Yes, it is continuous, to be developed, and I don't know how much money we have put into it, but it's close to a couple of hundred million dollars, I'm sure.

TP: Are there any competing programs?

IB: Yes.

TP: Was there a need to be?

IB: There have emerged a few. There is one. This is a complicated story. It's about people knowing people, and people moving from one place to the other. But for the time being we have one in Italy, which is actually originating from the U.K.. We have one in Norway or two in Norway, actually. Yes, that's about it, those three. And the French, of course, made one, but just for internal use. They always do that. They want a second opinion. So you can say that what we have is the standard, industry standard, and then there are several second opinions after, because the industry, they usually like to have a second opinion because there is a lot of uncertainty associated with these calculations. It's complicated.

So one thing we have done which is [unclear] is to establish what we call OLGA Verification and Improvement Program, where we have invited oil companies to participate, preferably with field data and money, some money, not very much money, but [unclear] data is what we are really asking them to provide. We have now built up a huge field database and also a lot of laboratory data which we have gathered from various sources. IFE has been doing quite a lot of measurements in a smaller scale than the SINTEF laboratory, but that's also very useful, because they can measure more details than we could in those days. So these data have been absolutely fundamental for the credibility of the program.

By the end of the day, it's about credibility. What do you believe in? You get a number. Do you believe it? Yes.

TP: I suppose as the industry moves into deeper environments, the hydrate issue, is that—?

IB: Hydrates, erosion, all these nasty things you can think of. What has been extremely interesting in the last, let's say, five or six years is that people are using it more and more for subsurface applications, for well flow. So we have a special application for web flow. For instance, a typical problem with modern wells is that they are quite long and with a horizontal reach, and it's unavoidable that these go a little bit up and down. That means that you will have the potential for accumulations of sand and particles and so on, which has not been cleaned appropriately out, and if you don't clean them, you may lose a huge fraction of the well, actually. We're talking many dollars in the cost here, really many the well action. We're talking many dollars. We have examples where they have actually lost a well like that, costing something like 100, 200 million dollars to drill. That's just the drilling.

TP: Just because of flow assurance.

IB: Flow assurance wasn't properly handled.

TP: So OLGA is being used to—

IB: To try to understand, first of all, try to understand what is going on, and then you can also try to use it to find the right remedies. So we have now been using OLGA for wells for a long time. Now we're also p utting it into a drilling application, because we believe that drilling is also a multiphase flow issue. You have water; you have oil and gas; and you have particles, the solid particles. And you have the transients, you know, the [well] kicks, things like Macondo and so on. They are extremely transient and difficult to see with normal instrumentation.

So what we try now is to make a kick model, for instance, so it can be a rig-side kick warning facility, so you let it run compared to some data, measure pressure, for instance, and flow, and the moment the program sees something that is not quite as it should, it can run several cases and find out whether there is a kick situation or not, and give a warning.

TP: Does it seem to work?

IB: It works in the laboratory, you could say. We haven't sold—maybe we have some test copies. So it is on the drawing board, but very close to a final product. This started, actually, quite early. Kjell Bendicksen, who's coming next, he will probably tell you more about one case where they used OLGA to calculate the

mud rate—that was back in 1989—to calculate the mud rate necessary to kill a blowing well. So it started quite early, actually. But it has taken off quite a lot in the last five, six years.

TP: So going back to the standard development of this technology, where was it most successfully applied? In pipelines in the North Sea?

IB: I would say that you could say that people don't do large subsea development offshore without using OLGA anymore. They took some risks, but not on the scale that we are talking about now. Now they don't, just don't do it.

TP: When did it go from being a technology that was used just in the North Sea to being an industry standard?

IB: Well, it was actually used in the U.S. quite early, actually. Some of the companies picked it up quite fast; Mobil, for instance. Texaco was also a part of this consortium. But it happened during the mid eighties, I would say, yes.

TP: This seems to be a common theme in this industry. A lot of technology development in the seventies and then widespread application in the eighties.

IB: Developed in the eighties, you could say. It was applied very early, actually. So, yes, and now we were purchased by Schlumberger last—

TP: [unclear]?

IB: SPT Group, we changed our name some time ago, because that's also part of the story, that some of the guys broke out, sold—Scan Power split up in the various components, risk and safety, went out, started their own company. Petroleum guys started their own company. Sold to an investor and sold it again to a private equity investor, and then the big fish came and bought it.

TP: So you're part of Schlumberger now?

IB: Yes, we are a Schlumberger Company.

TP: Since when?

IB: That was May, June this year. There was a large conference here in Houston, in June, where we attended PTU. That's an internal conference. They're big, those conferences.

TP: Just after the OTC, which is usually in May?

IB: Yes, it must have been around that, yes.

TP: So SPT Group was—

IB: Which is now—

[crosstalk]

IB: Yes. SPT was the petroleum part of Scan Power. There is a lot of details.

TP: As an American, a typical American who doesn't know just the basic stuff about European business, all the little companies in Norway, it's hard to keep track of.

IB: I understand. But now we are Schlumberger. Now it's easy. [laughs]

TP: It seems data must be crucial because you're modeling something incredibly [unclear]. It seems almost as challenging as people trying to model climate. You've got all these forces that are combining [unclear].

IB: It's a very good analogy. Those guys have an additional problem. We can usually confine the fluids in a pipe. The rest of the [unclear] is another story.

TP: Not the same kind of feedback.

IB: No, we don't have the same free circulation, although they also have a limited volume. But I think their problem is, to some extent, more difficult, but it's not easy what we are doing.

TP: You might think about people modeling natural forces, who want to develop quantitative models for natural forces that seem to be predictive.

IB: That's fantastic. Old [unclear], he did a good job. [laughter]

TP: But in ways, you know, that [unclear].

IB: Yes, and in this field, all the topics you have, the fluid mechanics, of course, the basic fluid mechanics, and you have the [unclear] solutions, you have chemistry, [unclear], for instance, hydrates, physical chemistry, and then you have mechanical engineering. We've got pumps and heat exchanges and separators and controllers, so we have the controller engineers sitting on the [unclear]. So we embrace a fairly big number of topics within that software which we had to deal with one way or the other. So the main thing is to get the right people, and we have been lucky. I have to say that. I'm really proud of working with these people, because they are very good.

TP: And almost all of them are from Norway?

IB: No, no, no. One of the guys who should have been here is Chinese, [unclear], and he has made wonders in that program, actually. He couldn't come because his son is playing badminton on the international team, and they had to practice five days a week, and he has to drive him to the training, so he couldn't come here because then he would lose some days of training and he would get kicked out of the team.

Then we have developers from almost all sorts of—we have consultants all over the world, more or less, so we are very international. And being such a small company, it's actually amazing. We started in Houston with Dick Shay and [unclear] Norris, and that has developed into about forty people, basically consultants, and we made an office in Perth, Australia, quite early, which is also growing very well.

TP: They develop [unclear]?

IB: Yes. We are in Asia; now we are in China; in Moscow.

TP: So you visit all these offices? Do you do the training?

IB: Yes. Well, we go. Yes, more or less.

TP: In those regions?

IB: I haven't been to Perth yet. We are in the Middle East, in Dubai, been there for a long time. So that's been part of the reason for the success, that we have been able to establish good hubs with clever people in the major petroleum centers, has given us a robustness which is vital, so we have never been depending on a lot of single [unclear], for instance. We can sell to everybody and we talk to everybody very easily, and it's about communication, actually, between people. That's what it is.

TP: You mentioned [unclear].

IB: Of course. He's not here.

TP: [unclear]?

IB: Yes. He was more or less the guy who had the ideas. You can discuss that with Bendicksen. They may disagree, but I think he was the guy who—he was inspired, by the way, as far as I know, he was inspired by a paper made in Tulsa, and that was Jim Brill [phonetic] and [unclear]. They did some experiments in

Tulsa, where they had a horizontal pipe, then a downward pipe, and a vertical pipe. They sent gas and some water, I think, air and water, a small pipe, and they got some tremendous slugging liquid accumulated in the bottom. Then the pressure was building up and the liquid was blown out, so you get a fairly nasty transient, actually.

When [unclear] read this paper, he said, "They need a transient simulator." IFE had already done that for several times, actually, for the nuclear business, steam and water, to calculate the transients in boiling reactors. So [unclear], who is here, he was actually involved with that very early. So IFE started with transient simulators definitely in the early sixties already, but for steam and water.

So Doug Brill saw this paper. "They need a transient simulator." That was how it started. They made this program. [unclear] wrote the first code, was quite young at the time, and they went out to [unclear] and showed them this.

TP: This is what became OLGA?

IB: That became OLGA. And [unclear] said, "Yes, we want this. We'll support you. We'll buy it from you and we'll support your further development." And the rumor is that they were sitting at the airport in [unclear] discussing this [unclear]. "We need a name on the program." Because all their programs had names, had female names, actually, Laura and [unclear] and something else. You can ask him if it's true. [laughter] He said—the story is that he said, "I have an aunt and her name is Olga. Oil and gas. Yes, that's it."

TP: And here I thought OLGA stood for some unpronounceable Norwegian—

IB: It's a name. Oil and gas. It's as simple as that. And in Russia they are really—so, yes, and that is part of the success. It's about communication, have a good name, good label, everybody remembers it. You can easily associate to it. It's so many nice software packages have these stupid names which you never remember, don't want to remember.

TP: A name like OLGA implies some kind of supernatural power or something, some kind of mysterious power.

IB: In Russia it's a female name. It's actually a variation of the German Helga.

TP: The famous Olga Corbut.

IB: Yes.

TP: I think we can probably wrap it up here unless you have anything else you'd like to share.

IB: No, I think we've talked for an hour, more or less.

TP: You've put this into perspective for us. I appreciate your time, and congratulations again.

IB: Thank you very much.

TP: See you at the gala tonight.

IB: I hope we can make the tuxedo fit. [laughs]

[End of interview]