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Deluge of Oil Highlights Research and Technology Needs for
Effective Cleanup of Oil Spills

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Link to video demonstration of CINC technology:
http://rcpt.yousendit.com/886302095/156538534818ed0c3b1d910c32ec33d2

Mr. Chairman, Members of the Subcommittee, thank you for the opportunity to speak here today and for raising this important discussion. I come before you as a discouraged U.S. citizen, and an entrepreneur with a partial solution to the tragedy unfolding in the Gulf. Seventeen years ago I purchased a licensed patent for a centrifugal force oil-water separator from the Department of Energy's Idaho National Laboratory. Today that technology, CINC, is the most effective and efficient tool for cleaning up oil spills that you've probably never heard of. Despite CINC's proven demonstrations in front of oil industry and government leaders, the technology sat passively on shelves for more than ten years, powerless to make right the oil spills that continued and will continue to occur. It is incumbent on us to do everything possible to clean up the massive spill in the Gulf. CINC has an important role to play in that legacy, as I will explain.

Introduction

The Exxon Valdez oil spill was a devastating and humbling moment for our country. The entire world community watched in awe as the U.S., the most powerful country in the world, thrashed and capitulated, helpless to save itself from the worst environmental disaster in history. We engineered nuclear power and put a man on the moon, but could not save ourselves from oil, the most basic resource involved in almost every aspect of our daily lives? US citizens stood heroically on the beach, prepared to clean up a mess that they had no part in creating. Such epic failure was hard for me to fathom, and yet the images of rubber boots, straw and soup ladles against an endless black tide confirmed this utterly demoralizing display of incompetence that would continue to repeat itself.

While it's not wrong to focus so much attention on large spills, we cannot diminish the smaller spills that happen around the world every day, estimates are between 5,000 and 13,000 in a typical year. For every 1 million gallons pumped from wells, it is estimated that 20 gallons will end up in the oceans. At our current

rate of oil production that means the equivalent of the Exxon Valdez spill every 7 months.

Partly in response to the Exxon Valdez, I resolved to commit personal resources to engineer a product that would be effective in cleaning up oil spills. Like fire extinguishers, oil-water separators could be stationed on every boat, harbor and port where oil was present. I envisioned the machine as a safety device, compact and portable enough that it could be a deployed on a small craft, and rugged enough to operate reliably in rough seas. The CINC oil-water separator can do all this.

I. Early development and patent history

Taxpayers paid for the early development of a liquid-liquid separator technology, licensed and patented from the Department of Energy (DOE), and Idaho National Laboratories (INL) a government owned, private contractor operated facility, in 1993. Originally developed to assist in nuclear fuel reprocessing (CHECK), the machine was then made available to the private sector to improve upon the licensed patent. Today the technology represents one of the laboratories highly successful transfers of technology, which makes the patent unique and of particular interest for the government and U.S. citizens.

In operation since 1949, Idaho National Laboratories (INL) is a science-based, applied engineering laboratory dedicated to supporting the U.S. Department of Energy's missions in nuclear and energy research, science and national defense. Like all other federal laboratories, INL has a statutory, technology transfer mission to make its capabilities and technologies available to all federal agencies, to state and local governments, and to universities and industry. To fulfill this mission, INL encourages its scientific, engineering and technical staff to disclose new inventions and creations to ensure the resulting intellectual property is captured protected and made available to others who might benefit from it. As part of the mission, intellectual property is licensed to industrial partners for commercialization, creating jobs and delivering the benefits of federally funded technology to consumers. In other cases, unique capabilities are made available to other federal agencies or to regional small businesses to solve specific technical challenges. INL uses a variety of flexible partnership mechanisms to advance technology development and to establish industrial partnerships that in turn benefit INL, DOE and the partner. Some of these benefits include: Increased technical breadth and depth of laboratory staff available to national missions; Leveraged federal research, development and demonstration; Reduced costs to taxpayers by using funding from other sources; and enhanced competitiveness for U.S. companies.[1]

[1] INL website: https://inlportal.inl.gov/portal/server.pt?open=512&objID=255&mode=2

The foundation of our CINC technology was created over 30 years ago and has been used by the Department of Energy (DOE) to recover valuable metal resources through a process of solvent extraction. In 1993 I was awarded a Technology Transfer from the U.S. Department of Energy (DOE) for a liquid-liquid solvent extraction technology, which we believed had the potential to be scaled up and commercialized in the fight against oil spills.

Dave Meikrantz, a scientist working for DOE, and the original inventor of the technology, came on board as the Director of Technology at Costner Industries (CINC), my newly formed private company.

Private acquisition and investment

Since 1989 and the Exxon Valdez, I had been thinking about investing in environmental solutions that could prevent the severity of similar disasters which were sure to follow. In Newbury Park, CA I was already funding research and development on flywheel technology that used magnets but it was not until I took possession of the DOE technology that Costner Industries was officially formed. My brother, Dan Costner, would go on to run the company.

We moved quickly to bring on a team of scientists and engineers for rapid research and development. The first two years were spent scaling up a protoype machine that processed only milliliters per minute. After that initial period of research and development we moved into production and manufacturing in Carson City, Nevada. Over time we created five commercial units with processing speeds that range from ½ gallon to 200 gallons per minute.

The fact that the machine was capable of separating numerous liquid elements meant that it could be applied in diverse industries including pharmaceuticals, chemicals, metals mining and recovery, food and nutrition, biodiesel, biotech and environmental clean up. As useful as it was in so many ways, and as profitable as it could have become through diversification, I zeroed in on one singular process with immense potential.

Over the next 17 years I would devote more than $20 million dollars of my own toward developing a rugged, compact, portable machine that could separate oil from water. At the height of our business CINC employed roughly 20 people in manufacturing and 15 sales representatives around the world.

As a citizen I recognized I recognized the need for this kind of technology. As an entrepreneur I seized an opportunity to fill a gaping hole where these solutions are concerned. CINC’s potential lay in the ability to become the first line defense in oil spill cleanup with the added benefit of valuable oil recovery.

II. How it works

Our separator was designed for use in oil and chemical spill clean up, oil production, remediation, nuclear waste and environmental clean up, or any application that requires the separation of two liquids with a variety of viscosities. Our technique is not hard to understand. The design is compact, portable and simple enough be operated with minimal expertise. CINC does not use chemical or biologic agents in it's clean up process. And separation is excellent: both oil and water outputs are greater than 99% pure as opposed to skimming which at best is 20% oil, 80% water and has additional storage and onshore treatment concerns.

CINC comes in five unit sizes. The largest, a V-20, has a footprint of five square feet and weighs around 4,500 lbs. The unit fits easily onto a fishing boat, dock or other vessel where it can process oil and water, separating 200 gallons per minute.

If response is quick, the lighter components of crude oil have not evaporated and the oil still retains its product quality. Crude oil, when left to weather, will become thicker and thicker, eventually becoming the tar that washes up on beaches. For this reason, CINC units can be most efficient as a first line of defense in oil spill and recovery if they are stationed at key harbors, bays, ports, oil transport and shipping boats, and on oil rigs – in other terms, anywhere where oil can come into contact with water.

Assuming 20 V-20's had been deployed to the Exxon Valdez in the first few hours of the spill on local fishing boats, 90% of the spill could have been recovered in less than 1 week. CINC is at its best working as a first line of defense, gathering oil before it has a chance to stray far from the initial spill point. The cost of recovering a spill on the ocean is a fraction of the cost of cleaning up tar once it's made its way to the shore (roughly $5 million for 20 V-20s versus $4 billion for the Exxon Valdez spill).

Approximately 0.1% of the water discharged back into a spill area contains oil.

Technological obstacles

CINC centrifuges have been installed worldwide for applications in the petroleum, chemical, mining, pharmaceutical, food, fragrances, printing, and environmental industries. The centrifuge performs a wide range of separation, extraction, washing and reaction operations. Unfortunately, CINC was never fully utilized in the way I intended because of a technical obstacle, but also, and perhaps more importantly because of a lack of support from industry and the federal government.

Fifteen parts per million became the elusive bar for CINC. To prevent pollution in oceans and freshwater, EPA rules became a factor. However, we would learn, some rules do not apply in emergency situations where clean up is occurring. Obviously you cannot compare the 0.1% oil being discharged from a CINC

machine to any other amount of pollution being dumped off a boat. It's a common sense calculation. And yet, this technology was not embraced by industry.

There are also examples where CINC confronted obstacles and was both flexible enough and proactive enough to overcome them. Following a demonstration in Japan we were advised that their main concerns with the centrifuge were: it's reliance on a dual power source, which was an inconvenience in certain situations; and the specific brand of skimmer used. Over the course of the next year, CINC attacked these problems. The Japanese response was positive, and yet frustratingly, immovable.

With all the modifications over the past year, such as the conversion to a single power source, and combining it with the more efficient Desmy skimmer, the Oil Spill Recovery System seems as if it would currently satisfy all the concerns that held it back from its prior approval. – Tadabumi Takasu, President of United Hi-Tech in 1998.

Despite our ability in this instance to meet the client where they stood, these efforts were not enough to promote further action by the Japanese. It was suggested that CINC continue with testing.

CINC continued to raise the bar with advancements in its design. A polyurethane casing was designed specifically for oil spill response models. This outer housing reduced the machine's overall weight by 1,000 lbs making it even more mobile and efficient for deployment in an emergency situation.

III. Advocacy and outreach

Beginning in 1993 CINC's sales staff, management and ownership began aggressive marketing and sales efforts targeting private sector industry as well as government entities to demonstrate our capabilities and to solicit support for the use of our technology. The results of such efforts were less than successful in the oil spill response and recovery markets.

Within the community of private sector oil spill responders responses to our equipment tended to be favorable. Indeed CINC impressed audiences across the board. Notwithstanding these positive reactions and experiences, oil spill response teams were bound by various regulatory policies and rules of testing that effectively stonewalled even the possibility of new technologies entering the market. For the purposes of their own protection, these co-ops and companies were not interested in any technology or method of cleanup that had not received the federal stamp of approval. In order to receive approval, technologies must be tested on actual spills, but the agencies charged with approval will not deploy untested equipment in a spill scenario. We were dealing with a classic and very unfortunate example of a Catch 22. More than XX spills occurred worldwide

between 1994 and the present, representing XX gallons that could have been recovered efficiently.

In over 45 documented cases, CINC made efforts to obtain the required certifications and grow awareness in the public and private sectors. When we were denied access to testing, CINC took on, at its own expense to demonstrate the effectiveness of our product and gain this critical access. We proved our capabilities in front of the very agencies charged with protecting and identifying new methods and solutions. The US Coast Guard, Marine Spill Response Corporation (MSRC), Minerals Management Service (MMS), US Navy, and the EPA were all made aware of the this powerful technology that deserved a place within our arsenal of defense against oil spills.

Federal outreach and response

In 1994 CINC made first contact with Ken Bitting, Civil Engineer for the US Coast Guard (USCG). We informed USCG that we were deploying technology and wanted to get the correct certifications and requirements to do so. Dave Meikrantz, CINC's Director of Technology, then visited the Marine Spill Response Corporation (MSRC) to understand what kind of equipment they were currently working with. Over the course of the next two years, CINC and MSRC stayed in contact through various meetings, calls, and hosted demonstrations. We requested to participate in their tests and were repeatedly told that there were not enough available funds.

Buccaneer Marine was an organization with crews that would run stand-by oil recovery duty when drilling was permitted off the California Coast. Although the co-ops were formally contracted for oil spill clean up, they would call on Buccaneer in the event of a large spill. In 1995 we ran sea trials of the V-20 under "rock and roll" conditions and discussed potential joint maneuvers for future oil spills. Jim Johnston, the skipper for Buccaneer Marine, had all the ancillary equipment to support oil recovery operations and a trained crew, but was not allowed to recover oil independently without an invitation from the co-ops and USCG permission.

The range of outreach conducted following our failed involvement with MSRC reads like an 'alphabet soup' of government agencies. Between 1995 and 1997 CINC contacted:

1. The California Department of Fish and Game to obtain their guidelines for Oil Spill Prevention and Response (OSPR).
2. Lloyd Nilsen at US Navy Systems Command, Arlington, VA. *No response.*
3. Kyle Mokelien at the Minerals Management Service. *No response.*
4. The Naval Facilities Engineering Service Center (NCEL) and provided a demonstration at Port Hueneme, CA.
5. Yuone Addasi at California Fish and Game. *No response.*
6. Joseph Vadus, Senior Advisor at NOAA. *No response.*

7. Clean Seas Official List (position sites for spills around the world). *No response.*
8. George Wilson and John Johnston, Senior VP of National Response Corp. (NRC) offering to make available V-20s at no cost in the event of a spill. *No response.*
9. All 75 solicitors entering into Basic Ordering Agreements with the US Coast Guard for containment, oil spill and hazardous clean up. *No response.*
10. J. Foster, General Counsel for the Federal Office Science & Technology Policy. Then Senate Minority Leader, Senator Tom Daschle sent the letter outlining CINC's capabilities, and requested that it be tested and considered as a powerful addition to our clean up arsenal. *No response.*

In March of 2001 I made a personal effort to communicate with the heads of EPA and the Department of Transportation. I sent letters to then agency heads, Christine Todd Whitman and Norman Mineta, respectively, explaining the extent of our centrifuge's capabilities and requesting their review and / or assistance. I emphasized that: "Unfortunately in the United States, we remain poised to respond to the next great man made environmental disaster from the same crisis mode as we did twelve years ago," adding that, "I am excited to show you [with the CINC machine] that we need not repeat history. The answer exists and it is readily available." EPA's response was noncommittal.

Hosted demonstrations for the benefit of government and industry
In addition to the phone calls, letters and general outreach that went unanswered CINC hosted numerous demonstrations for representatives of government, industry to emphasize and reinforce CINC's power and efficiency. We also presented and participated at various conferences and trade shows to elevate the profile of our product.

CINC hosted and / or presented at the following events:

1. Clean Gulf Conference, FL.
2. US Coast Guard Oil Pollution Act – 90, Kings Point, NY.
3. International Oil Spill Show, Long Beach, CA. CINC hosted a private demonstration at our facilities, providing private bus transportation and dinner for guests. In attendance were USCG's Director of Research and Development, Ken Bitting, representatives from MSRC and UNOCAL.
4. International Ocean Conference of the Marine Technical Society.
5. Monterey Harbor demonstration for California Fish and Game and the US Coast Guard.
6. At OHMSETT, a US Navy and US Coast Guard facility in New Jersey, CINC is tested under real life oil spill conditions. Following a successful demonstration CINC hosts a dinner event in New York City.
7. US Representative Lois Capps convened a conference in Santa Barbara to discuss oil spill technology. CINC demonstrates before a variety of

stakeholders in the oil industry, research institutions, and other federal agencies. “As TV cameras rolled Friday morning, the Costners and their team successfully demonstrated how the separators work. A temporary water tank was installed in the harbor’s parking lot and the water was fouled with diesel fuel, which the machines then cleaned up.” Santa Barbara News-Press, April 21, 2001. Government representatives in attendance were: Lt. Graves, USCG; J. Lisle Reid, Regional Director, Mineral Management Service; and Heather Parker-Hall, NOAA representative.

8. Terminal Island, CA, test performed for US Coast Guard Task Force for Contingency Planning. EPA, MMS, FEMA, Fish and Game, and the California Coastal Commission were all in attendance.

In not one single instance did we receive a follow up response to these successful demonstrations. It was frustrating to know how to move forward. We were told the machine had to be proven and tested. When we were denied the opportunity to participate in those tests, we did demonstrations of our own, in an effort to claim the attention we felt we rightly deserved. We earned the respect and of our audiences wherever we went, and yet still were denied any real support. It was extremely difficult for us to know how to move forward doing business in the US.

International use and response

For ten years CINC went about targeting international governments and private entities involved in oil or hazardous spill clean up, in much the same way as we did in the US. In many instances we offered use of our machines at no cost wherever oil spills were happening around the world. Despite these efforts we were mostly denied a response from the following entities:

1. Canadian Marine Response Management Corp. responsible for oil spill services and equipment and Larry Wilson of the Canadian Government. *No response.*
2. Oil spill offices in: United Kingdom, Netherlands, Sweden, Italy, France, Germany, India, Australia, Denmark, USSR, Japan.
3. Autralian Emergency Services (AES) and Hartec Systems Anchorage were contacted and offered our equipment and assistance in cleaning up the Komi spill. *No response.*
4. Offered clean up assistance to Marius Mes of Phillips Petroleum of Norway. *No response.*
5. Offerned equipment for a spill in Wales, to the Oil Spill Response Lim. And Joint Response Center. *No response.*
6. Peter Oosterling, General Manager of Shell International, The Hague. *No response.*
7. Test performed in Kuala Lampur, Malaysia for the Deputy Prime Minister. CINC transported a V-10 unit and had a successful demonstration. *No response.*

In 1997 we airlifted a V-20 CINC unit to Japan to aid the oil spill clean up caused by a cracked Russian tanker. Although severe weather kept us off the sea, the effort did demonstrate our unit's mobility. The $700,000 price tag for transporting our machine further confirmed our commitment to providing real world solutions to protect our environment and resources.

Business repositioning
We jumped through every hoop that we encountered, but without key institutional support or regulatory action, we didn't have any buyers, and thus, the market was nonexistent. I had to suspend my intentions for the oil-water separator and the company went on to diversify into other markets including pharmaceutical and chemical centrifuges.

My passion and desire to succeed with CINC never waned. Roughly nine months ago I formed WestPac Resources LLC with my partner Pat Smith, with the intention of attacking the15 ppm problem that had been a sticking point for government and industry alike. We took a step back and reevaluated the process with a federal lab focusing on systems engineering. We found an engineer at UCLA, Dr. Eric Hoek, who believed that he could create a backend nano-technology filter membrane to reduce oil-water output to below 15 ppm – the key to CINC's commercial viability in certain sectors. Again with private resources and no institutional support I found myself pushing this technology uphill because I believed in its potential.

Ocean Therapy Solutions was born to provide global solutions for oil recovery. OTS utilizes the CINC centrifuge and will incorporate nanotechnology developed by UCLA to produce oil-water output of less than 15 ppm. OTS is currently working in concert with the Parishes of Louisiana and BP to deploy the CINC machines into the Gulf.

IV. Present capabilities and future needs
The fundamentals of the CINC centrifuge are strong. This system model for liquid separation by centrifugal force has proved time and time again to work with diverse elements and under stressed circumstances. For these reasons, scientists and engineers at the Aerospace Corporation are exploring options with us to optimize CINC centrifuges for possible work in the Gulf. If CINC is deployed in the Gulf it will surely encounter new mixtures, emulsifications and viscosities, which will require engineering attention and "fine tuning." These challenges can and will be met. Aerospace is also evaluating satellite and airborne sensor data and Ground Truth Data to help improve situational awareness to aid in the most efficient placement of CINC machines in the Gulf.

Ten V-20s are ready to be deployed in the Gulf at this moment. At our Nevada facility we could begin scaled up manufacturing immediately. This facility, as well

as our other strategic manufacturing partners, could provide hundreds of CINC machines in a matter of months.

In addition to separating oil and water, CINC centrifuges have been used extensively in oil production. CCS and ET&T are two mid-stream contractors working for US oil manufacturers that have experience with CINC machines. In fact, ET&T bought the first V-16. We also know that a Dutch oil processing company has been using CINC's for this purpose.

Legislative needs

The government agencies and entities mentioned here should not be singled out for their indifference. Between 1994 and 2004 we contacted every major oil company in the US in an attempt to gain their awareness and support for a technology that could both protect them and the environment in the event of a spill. The most apt word to characterize these interactions was apathy. Simply put, the need for such technology was not recognized at the time we brought this product to market. Now the whole country and the world will recognize the need for preventative spill clean up technology. I am saddened by the disaster that has brought this conversation to bear and also happy to see our technology finally have the chance to take center stage in providing high quality environmental solutions.

Our President has made clear that he does not want to put Americans out of work, but the moratorium on oil drilling is now moving supply rigs overseas to foreign territories. Our President's main concern, as I understand it, is to keep Americans out of harm's way, by not allowing them to work in unsafe environments. CINC machines stand ready to be deployed for immediate clean up, but they also provide the unintended benefit of putting people back to work.

If legislated as a safety standard, CINC machines would be like fire extinguishers for the oil industry, to be kept close at hand wherever oil and water have the opportunity to come into contact. Like any other emergency device, the hope is that you never have to use it, and yet it is reliably there when you need it. CINC machines provide a safety assurance such as the oil industry has never seen. Their effectiveness remains unmatched by any comparable technologies in the past thirty years. In putting CINC to work, we have a situation where regulation can be very good for business – putting rig safety operators back to work, in a safer environment, with American made machines.

In our experience with the "clean up" industry and government regulatory agencies responsible for protecting our environment and the public, we have learned that interest in any sort of solution is event driven, piecemeal, and reactionary. Following each major disaster there is a frantic search for tools and answers, but its always too late. This is a great failure of our system because we do not have solutions available when we need them the most. Fortunately, we

have a solution that is readily available to set things right in the Gulf beginning tomorrow if we make that decision.

Conclusion

We are all at fault here. It's just too easy to blame BP. It took oil for me to fly here and it will take more oil to solve our problem. What we need to do now is come together. What I can provide it a technology that is available immediately, a technology that will allow rigs to resume operation and to put people back to work. Every day we wait to deploy we lose more wildlife, coral reefs and our way of life.

US Coast Guard has used terms such as, “under assault” to describe conditions in the Gulf. He has it right that this is a war to be waged with all the tools, methods, and techniques we have at our disposal. Since the last great debacle (Exxon Valdez spill) there has been too little institutional effort devoted toward defining, identifying and qualifying the best “tool chest.”

I heard it stated that throughout the 19th and 20th Centuries, each time America has been compelled into war, we begin fighting it with the methods, tactics, equipment and technologies used in the last war. I believe that statement to be not only poignant but also accurate to events unfolding in the Gulf.

We have the opportunity to provide the American public a solution to the Gulf oil spill and to tell the story that demonstrates the power of combining government resources with private ingenuity. Thank you for this opportunity to speak today. As an entrepreneur, a pragmatist, and a US citizen I am committed to ensuring a positive environmental legacy for the Gulf and all waters around the world.