

Notes on 18 October ISPR call with McNutt

- Describe when you first got involved in the spill response, how you were engaged, what your role was throughout.

McNutt: I started putting this together for my own records... on Tuesday 4 May I left with the Secretary to go down to the Gulf. We spent a couple of days going to the various command centers that'd been established, ending the trip in Houston at BP headquarters, visiting Cameron. Based on that trip, the Secretary decided he wanted me to stay in Houston as his representative there to help with the response – not in the sense of those who'd be helping with oil reaching the shore, but with well intervention. He saw Houston as the brain center for the engineering it'd take to collect the oil and kill the well, and he thought with my background, I'd be best used in Houston.

- At some point you became the head of the Flow Rate Technical Group...

McNutt: That wasn't until later. For some time I wasn't that aware of what was going on with the flow rate issues. Within the USGS had, in parallel, decided we'd employ the ABARIS instrument in an aircraft with NASA's help to get the image of the oil in the water.

- This is early in the game?

McNutt: This was on about May 6. We had heard that there were questions being raised about the flow rate and the advantage of the ABARIS instrument is that we knew that the first estimates of flow rate had been based on spill area and estimating a flow rate from that (was before video was available). The advantage of ABARIS: measures not only flow area but thickness (infrared does that). It was going to kick this into a third dimension. That was when I started corresponding with the Coast Guard about this project, offering to Admiral Allen that we'd be happy to make all of our information available to the Coast Guard. At about this time... or a little bit later... the Secretary came down to Houston and told me about the flow rate technical group... around the 20th or so of May that he came down to Houston and discussed the flow rate technical group that was being stood up. He said he thought it'd be helpful if I chaired it, that he'd be talking to Allen about it.

I realized this could be good when I realized that the Plume team was having serious problems getting adequate data. At that point Willy Taylor at DOI was the head of the team... there'd been serious miscommunication with BP about what was needed. It was very helpful to have someone in Houston to have someone who knew ROVs and how ROVs recorded data. Scientists were used to scientific data and quality work. When a scientist goes down with a research class ROV, they want a piece of data, put a file marker on the tape to make sure they can find that piece of information → a reasonable sized file that they end up dealing with. Work class ROVs: never wrote end of file marker, so they'd have HUGE files that couldn't be FTP'd, printed, etc. There was no internet type big enough to send those files. So the only way BP could do it was to resample the files → downgrading the quality of the video each time they did it → accusations of BP corrupting the data. McNutt said: Just send the hard drive. FTP them the hard drive, it won't cost anymore, they can hire a video specialist that'll come in and do professional video editing and get the data without it being degraded. After this, the scientists were perfectly happy



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with the data. Willy, working from the DOI office, had no way to understand all of this (especially as he'd not worked with ROVs before). Everyone was trying to get the job done, but there was a lot of miscommunication, misinterpretation of intention.

- Did you select the members of the FRTG?

No.

- Did everyone work out?

There were a couple of problematic people. There were definitely people who were not even B-team members who contributed nothing to the end results and spent all of their time on CNN and other talk shows speculating on results and data that they hadn't even seen, irritating conscientious team members who were working hard to get the answers. We didn't want to muzzle those people as we knew it'd backfire in the end... didn't want people to think we weren't letting people talk to the press. Some people clearly did not have the credentials to be on the team that were selected.

- Was it useful to have the group exist?

I think so – and in the end, it proved its worth. Woods Hole came in really late and had a great proposal. People on the video team completely panned it. The B-team people were the ones who panned it the worst, saying that 'everyone knows this technique doesn't work.' That's not true, is based on an irrelevant, not-comparable test. Based on the B-team's planning of the proposal before I became leader of the group, the Coast Guard had refused to let Woods Hole onto the team. When I came on, I said that this was ridiculous and Woods Hole had 3 times the credentials of the people who panned their methodology. B-team people continued to throw potshots at the Woods Hole people. The Woods Hole people came through and nailed the flow rate, they're the ones who got the samples who corrected the video team.

- What other experts did you bring in (beyond the Woods Hole people)?

Well... DOE people were doing great work, too, especially with the capping stack.

- Did you feel like your group was appreciated by NIC?

Yes, very much so – they were so appreciative, always.

- Can you briefly tell us the different estimates and how they were refined over time using different techniques?

Let me give you the final result and I'll go backwards... and tell you the tortuous path that got us there. Final result: shows you in days over the incident. Day 87, we close it in with the capping stack. Walking back... let me tell you how we got this. Closed in the capping stack, DOE by closing in the choke got a pretty precise estimate – 53K bbls/day +/- 10%. Then, these little discontinuities... because when the capping stack was put on – these jumps are changes in resistance at the wellhead. This overall trend is just depletion of the reservoir... this trend is reservoir depletion and that was calculated by USGS

hydrologist called Paul Shea. He did that by watching when the well was shut in with the capping stack – the shut in curve, you imagine that that puts pressure back in the reservoir over time, gives information about the reservoir properties. Got a really good indication of how the reservoir had behaved over time – we'll have a writeup on that soon, planning a publication of PNAS that'll have all of these papers in it.

In terms of various flow rates over time... the Woods Hole number fell right there (point to graph) – they nailed it. No uncertainty that they got the right number. They had the most elaborate experiment but it was the most precise. Took the work-class ROVs, brought their oceanographic equipment in... this was memorial day weekend... they had an imaging sonar and an acoustic Doppler current profiler. Imaging sonar → size of the leak coming out of the end of the riser, and the kink. The acoustic Doppler current profiler gave them the velocities of both jets. The interesting thing is that their equipment was certified to safety standards for UNLS (university national laboratory standards something). Other stuff was ABS-certified – Oceaneering didn't want to use UNLS-approved equipment. Memorial day weekend... Woods Hole's last chance (they're about to cut the riser kink). How to convince Oceaneering? I called up the director of (something) who'd worked at Oceaneering before, we worked through the UNLS safety manual... when I was the head of UNLS, I'd worked with it... and we worked to make sure our UNLS stuff met all of the ABS ones, the guy called them, walked them through step by step to make sure they knew. So the Woods Hole measurement was only a riser cut one.

There was a CG lieutenant John Kusik (sp?) who was fabulous. Woods Hole people had to go back to sort out the oil to gas ratio... to get that you have to take a bottle down there. The bottle has to be pressurized. So it's basically a bomb. The bottles hadn't been tested in about five years – way outside of UNLS and ABS standards. Kusik helped with the retesting and deployment of the bottle.

Plume team had been using .29 as their estimate – Woods Hole data showed it was .41. So I went back and recalculated with this new ratio. Taking the video data with their 25-35 they reported, correct to stock tank barrels at the surface, correct for the new ratio... that doubles it. So there's the pre-riser cut video → now 50-60K barrels estimate for that period, post-riser cut estimate = 50-55K. Perfectly correct. But before you make those corrections, you were doing stock tank barrels at depth rather than at surface, and wrong ratio.

- From Carl... looking at an LATimes article... first time there was a flow rate figure above 5000 barrels/day was May 27... before riser cut and before Memorial day...

Basically, the 12-19K bbls/day estimate from the mass balance team... that was from ABARIS data, only counts the oil that makes it to the surface... what we realize now → figuring out what oil was missing... realizing how much oil had been entrained in Mississippi sediment.

- Carl again: one of the disconnects we've noticed that was released by FRTG/UAC... on May 27... NIC released figures they said they said they'd gotten from UAC that was 12,500-25,000. Why that gap?

There was a problem that was later corrected... at that point the video team had only supplied lower bounds between 12 and 25000... the mass balance team had gotten these numbers that they adjusted

upward... it wasn't until a few days later when the hard drive had arrived got the numbers up to 25-35 were available from the video team. For the first number, video team only wanted lower bounds, which they had at 12-25. The reason they only wanted to give lower bounds... NIC and UAC had a hard time with the concept of lower bounds. There were a number of experts on the plume team... said their lower bound – all did it – giving us a range of lowest estimates. Because people didn't understand that concept it was reported wrong → pleading with NIC and DOI to get communications fixed.

Let me explain why the plume group only wanted to give lower bounds at that point. At that point they only had re-sampled data, didn't have the full hard drive. They were concerned they'd been sent selected data that only showed low-flow conditions. They thought it was unlikely that BP would send us data showing worst-case scenarios... so we feel confident releasing lower bounds for the flow, but not for upper bounds. Once they had all of the data, they felt confident about going up to 35K.

- More Carl: Sounds like there was a general distrust for BP, so they adjusted their estimates to that distrust.

Well, no... just meant we only released the lower bounds.

- Carl again: the 20-40 range came next (June 10) and then 35-60 range (June 15). What changed there?

That was the post-riser cut estimate that changed it. Working off of a pre-publication document about flow rate... addressing, if there's another situation like this one, what worked here/didn't/should/shouldn't be repeated. The acoustic technique worked best. The video technique though, if you have a sample to get the ratio, that's an excellent one.

- Carl, once more: I'm very interested in your feelings... there was this pervasive feeling in many cases that BP was selectively providing/withholding information... and every time we try for substantiation on that, it's tricky... but on the whole, what's your assessment? Was BP working to shape control the information?

Let me put it this way: There was no stonewalling from BP on the flow rate issue, but there was a huge difference between the no-holds-barred, no-cost-too-much, everything-but-the-kitchen-sink thrown at it response to well intervention and well kill response that they had versus their complete lack of interest in flow rate. If they had put one percent of resources into flow rate, we would've known flow rate on day one. But they were absolutely uninterested in it, so it had to be done on an entirely not-to-interfere incident basis. It's not that they tried to get in the way or hide data, but it was not a priority and not important because they didn't see that it was important. And I'll tell ya, that was 100% wrong. Top kill failed because they didn't know the flow rate. They assumed – and their engineers told me – that top kill wouldn't work if flow rate was more than 13,000 bbls/day. They put a lot of effort and lost a lot of time because they didn't know flow rate. If they'd spent a day working on flow rate, they would've known that top kill was a waste of time.

Top kill officially ended on May 29 and had begun on May 26... but they'd been mobilizing it ever since cofferdam failed (planning it before).

- Carl! Again!: Early on, when we interviewed NOAA, one of the figures we used that seemed to get lost in the shuffle was production rate for the well – that was what BP thought the well could produce open ended. That was 162,000 barrels per day. Some plans have worst case production capacities of 100K+ - were those numbers ever brought forward in these discussion?

We had our well monitoring team bring forward what they saw as worst case scenarios, and they didn't come up with anything like this. Worst they came up with, highest of the high: 118K barrels/day – that was for a flow path that had flow behind the 9 7/8 inch casing.

- David Moore: You've talked about several different teams. You haven't mentioned the reservoir or nodal analysis teams. Were they active?

They were active, reported in a little late (in their response). It took awhile to get the contracts in place for the reservoir modeling group. Their plan was to go with contracts out to LSU, Tulsa University, an org called Gemini → once their reservoir models were done, the well modeling group was going to use that as input. Took a really long time to get contracts, non-disclosure agreements in order → very short time to work → reporting in late.

In terms of the final report I've written up, I think this approach can be quite valuable. These groups could play the 'what if' question bc they were using modeling... if those contracts had been done quickly (and after this experience, we think they could)... they could ask questions like ones about drilling multiple relief wells and draining reservoirs based on these models. You can change configurations at the wellhead, rates of depletion... there were huge contributions that they potentially could've been made. Not sure if we used them the right way.

- David Moore: What contributions did DOE make in particular? We've heard about the Secretary being effective, some technology they used... what did they offer?

When I first got there, the DOE team was doing gamma ray imaging on the BOP. The BOP was sitting there on the bottom, this black box... no way to determine which of the rams had been deployed/were closed, which hadn't been. And so the gamma ray imaging was used rather successfully in some cases. As time went on, their contributions became much broader – given that this is not for attribution, Secretary Chu brought in his group of external advisors. They were a blessing, but also a distraction. Some of them made some suggestions that were exceptionally helpful – like Dick Garwin was the one who actually suggested post-top-kill that choke/kill could be turned into production on the Q4000 and once top hat 4 was on, Q4000 could be used to produce off the well. And that's what happened – 10,000 bbls/day that didn't go into the ocean.

On the other hand, for the most part, this group of Chu's advisors were sort of stationed all over the country... and our view in Houston was that they were for the most part logging in ideas... physicists with no experience in the ocean. Our job was to protect the people in Houston from having to chase

down wild goose idea. Most of these people were important enough that you couldn't just tell them it wouldn't work – you had to prove it to them with calculations. So a lot of the DOE time was spent running these things down... some of their time. A lot of their other time was spent doing very valuable things looking at resistance in the BOP... BP had built this case that the pressure release discs in the wellhead failed during top kill and we spent a lot of time having to prove that was wrong, that we had well integrity – DOE helped USGS with that. They worked on understanding resistance at various points in the BOP... I probably have more email on that differential pressure measurement than anything else on this entire oil spill... proved to be a wild goose chase with no relevance to figuring anything out. Because Chu's people were physicists, they loved pressure data → 3 national labs trying to analyze pressure gauge inside the top hat. Finally, as luck would have it, lightning struck and brought the Q4000 down → 10,000 bbls/day suddenly weren't going up the riser and the pressure gauge didn't move → convincing them that the pressure readings they were getting were useless.

- David Moore: Seems to be some concern that the oil budget underestimates how much oil is left in the Gulf. How confident are you in the numbers in the budget that's currently out?

I think the oil budget basically says that 75% of the oil REMAINS IN THE ENVIRONMENT IN SOME VERSION OR ANOTHER – as dispersed, evaporated, or unaccounted for oil. The way I look at it, pretty grossly, is that about 25% of the oil was either collected at the source, or skimmed or burned... about 25% of the oil was dissolved or dispersed... about 25% of the oil was evaporated... about 25% of the oil was initially unaccounted for. We think a large part of the unaccounted oil was trapped by Mississippi Canyon sediment. Means that 75% of oil is in the environment.

- Dave Moore: where'd data about skimming, etc. come from?

Coast Guard.

- Dave Moore: Oil budget – did everyone sign off on the oil budget before it went public?

The two main leads on getting sign off on the report... the tensions in it... were in NOAA and EPA. There was definitely back and forth between them. I was out of communication out camping during that so I don't know exactly what went down. USGS decided that EPA/NOAA needed to be the experts in that part of it.

- Carl (again): We've all seen the 4.9 million barrels figure as the total released.

That should have a +/- 10%.

- Carl: What's the origin of that figure? Is it part of the document you've got?

Yes and yes. **Ask her about the report she's speaking off of when we interview her later this week – it's in review but she sounds willing to give out copies.**

- What went well and what went poorly and how to improve in the future?

From my vantage point in Houston, what went well was that in every decision after top kill... after top kill went wrong, the government decided that every decision from here on out, we have to agree to. When you think of the position BP was in, with fines mounting every day – it could've been a tricky situation if the government scientists (there were a bunch of us there) ... meant that the government had to order things, they could take on liability... or BP refusing to do what gov suggested because they wanted to do things their way... everything could be flowing still, in court. But what happened was that we closed it in without ever involving a lawyer... we agreed jointly about everything because we always used the methods of science to figure out why we didn't agree about decisions (different data? Different interpretations of it? Different assumptions?). Used the scientific method to guide all of our decisionmaking.

This is almost a given in something like this... it's almost always about the communications. In Houston, we turned off our TV. The only person we paid any attention to was Thad Allen, because he was the only person who seemed to get it right. Everyone else, we'd say 'does that sound like what we're doing here?' They'd say we were at each other's throats, we weren't getting along, etc.

- That'll be hard to fix in our current media climate...

Yeah, it seemed like the media went out of their way to insert wedges where they shouldn't be, pitting people against people where there wasn't ever a problem.