

***REVISED* (see May 21, 2018 meeting minutes)**

NUCLEAR ADVISORY COUNCIL MEETING

Gressette Building, Room # 209

October 12, 2017

1:00 – 4:00

Rick Lee: Call to Order – Approval of Minutes & Update of NAC Activities

Attendees: Claude Cross, Sylleste Davis, Carolyn Hudson, Rick Lee, James Little, Vincent Van Brunt, Tom Young

Dr. Vincent Van Brunt moved; Captain Claude Cross seconded; the minutes for the July 13, 2017 meeting to be approved and they were accepted.

Rick Lee: I have a few items I want to go over with you. First, during my visit to Savannah River a couple of weeks ago Jack Craig made a kind offer to host a meeting of the Council down at the site. I think it's been quite a while since we have had the opportunity to do that. I was going to propose to the group that we accept his offer and try to schedule it for January or February whenever the next meeting is. Are there any objections? Ok then we will take care of making sure that happens. A couple of business items we have an opening for the nuclear power appointment, I am willing to accept either now or any time any suggestions regarding someone to take that open slot. I have made contact with Duke as they own the largest fleet of nuclear power plants in the state and it seems reasonable they should be a participant with our group. I have not yet gotten a response from them either yah or nay in regard to it. If you have any suggestions, please forward them. Secondly, I have a couple of items to give you. These are some handouts I wanted to give you of letters, events, activities which have taken place since our last meeting and the first one is one that came as a surprise to a number of us. Dr. Peterson who has served with this group for an extended period of time passed away. I have given you a copy of his obituary. He was a fine gentleman. I was very surprised to learn that in addition to being a classic musician he was also a member of a rock band, an avid golfer and a fine member of his community. If you know his family or care to extend your condolences it has occurred some time ago, but I wanted to make sure everyone was aware of it. That puts us in a position of needing an additional new member for the council and this would be for the academic appointment to the council. We are open to suggestions on that I have made a few inquiries looking for candidates so if you have some suggestions please forward them. I am personally interested in perhaps participation by South Carolina State University. They have an outstanding nuclear engineering program and it would be good to have representation from their organization. In the next week or so if you have any items please bring them forward. I

understand that at the last meeting Westinghouse had scheduled to speak to us at this meeting, there was some discussion of that and I apologize I was unaware of it. The agenda was assembled before I learned that. They have kindly agreed to join us at our next meeting. If you have questions or items for them, please save them to then. In the handouts I have given you the Governor has been very active as you know in trying to come to a conclusion with regards to Yucca Mountain and the MOX project. There was a meeting of the Southeast Energy Board a couple of weeks ago where he presented two motions seeking approval of the group to endorse for completing and making operational Yucca Mountain as well as a motion of support with regards to the MOX facility. I provided most of those motions for you to read at your convenience. The Governor did send a letter to the President with regards to MOX. I have provided you with a copy of that for your information and a couple of newspaper articles regarding MOX and things from the Aiken Standard and other publications. The Governor did attend a meeting at Savannah River. He got a tour of the facility; he continued to express his absolute support for Savannah River and the great things it does for South Carolina, the tremendous opportunities it has for South Carolinians to have employment and grow their careers. Last there is a handout in here from Savannah River it was kindly given to me during a visit I made a couple weeks ago. It's an operational update for your information so I think that will have value. There are additional articles in here dealing with WIPP, the roof collapse and some other items that I think will be of value for your reading purposes. Are there any other businesses items that we need to bring forward to the group before we get started with our agenda? Hearing none let's start with the South Carolina DEHEC update. Ms. Wilson, do you care to brief us?

SCDHEC Update, Shelly Wilson, DHEC, SRS Federal Facilities
No Slides Used

Question from Council:

Rick Lee: Very timely information I certainly appreciate it particular to light of the fact that we will be discussing on the agenda the HEU topic that you approached. Are there any questions from the council? Thank you very much we certainly appreciate it.

SRS Update, Terry Spears Savannah River Operations Office, (SR) Deputy Manager
(Slides available here <http://admin.sc.gov/node/1543>)

Question from Council:

Dr. Van Brunt: Small question on the evaporator you said that is scheduled for this December getting back on line?

Mr. Spears: No I didn't say that about the evaporator but if you don't mind Dr. Van Brunt I would like to defer that to Mr. Folk.

Dr. Van Brunt: Sure no problem.

Senator Young: Mr. Spears, just briefly if you could comment on new missions for the site and beyond the cleanup that's ongoing by the different contractors. Could you address what are some potential new missions in the pipeline for the site?

Mr. Spears: I can't really confer what we are discussing the potential new missions. Our roll down here at the site is execution. What I can say is we have a National Laboratory at the site. The National Laboratory is an enduring mission for the site. It is an EM laboratory, but it is not planned for any kind of closure or completion that is an enduring mission. I can't see anywhere but up for the mission associated with the National Laboratory. They have relationships with many commercial entities in the United States, federal government agencies, outside the Department of Energy, and other Department of Energy programs currently. I think they are a vital kind of thing in terms of just technology not only for execution of DOE missions that includes NNSA but also for commercial enterprise and for national security worldwide. I can also say that as part of that we are looking still at the advanced manufacturing collaborative which I know many of you have potentially heard of associated with the National Laboratory. The plan is to build a facility currently slated for the USC-Aiken campus in Aiken that would be something where the laboratory can reach out and engage with commercial enterprise as well as governmental entities and academia off the reservation of the Savannah River Site. Do that in a manner that is collaborative and benefits all those entities. That's still alive and still under discussion. We are hoping for good news on that this year. There is still no interest in that lets say while the new administration whose looking hard if we can move that forward. So I think those are sort of the seeds of new missions there at the site perhaps the types of activities the laboratory would engage in long term and bring to the site. Otherwise I would just say and certainly not EM business at this site we have NNSA at the site. NNSA is a national security mission, they have the tritium enterprise and other missions at the site and those are enduring missions for the site. What they have planned for the site in the future I cannot comment on or don't know but I will say that isn't going anywhere that is planned to endure at the site in perpetuity.

Senator Young: Do you know what the status of the AMC proposal is at the Department of Energy?

Mr. Spears: We have provided the proposal forward it has gone in the past to the Office of Management and Budget. We have been in the process of resolving their questions and issues. Also we have had an administration change of course and so we are reengaging with the new administration for decisions that are necessary to execute the plan for that is a capital lease and so there has been a lot

of work down that avenue. We still need the headquarters approval to actually sign the lease and execute that to move that forward and develop for the facility. We are waiting on that approval currently we are working to still answer questions associated with the decisions.

Senator Young: Thank you.

Mr. Lee: I just wanted to ask with regards with the funding of SDU7 is it fully funded for its life of the project.

Mr. Spears: SDU7 is one of the areas that we are anticipating funding for successive years FY18 and FY19 and currently with the House marks there likely could be impacts unless we can correct the budget levels that Congress is entertaining currently. That is one of impact areas slowing down the pace of SDU7. Where that will turn out I cannot tell you, but I am hoping there will be no impact and it will be fully funded in January.

Mr. Lee: In your discussions with the budget has there been a logic to the items that have been cut or suggested for reduction from the original request or has it not been articulated that clearly yet?

Mr. Folk: Our insight into that Mr. Lee is through the House and Senate marks and whatever is documented there. I can't say that is necessarily clearly articulated as to logic just a fact that when you look at the numbers and how they are racked out those is the areas I mentioned and the areas that are potentially affected.

Mr. Lee: Thank you. Are there any additional questions? Next up will be Mr. Jim Folk and Mr. Tom Foster. Thank you for joining us today gentlemen we look forward to your report.

Liquid Waste Update, Jim Folk, SR Assistant Manager for Waste, Waste Management, and Tom Foster, President and Project Manager, Savannah River Remediation
(Slides available here <http://admin.sc.gov/node/1543>)

Question from Council:

Mr. Foster: While they are bringing the slides up I will address Dr. Van Brunt's earlier question - Small question on the evaporator you said that is scheduled for this December getting back on line? I do not actually have a slide on the 3H Evaporator in here. You mentioned there was the Melter I will talk a little bit about and that is scheduled to come back on line in December. The 3H Evaporator actually has been a very interesting project. It developed a leak about a year and a half ago and it was not simple at all to find where the leak site was because the evaporator is encased in some insulation, so we had quite a bit of work to get to that point. We finally located the leak and it turns out the evaporator has a cone shape to it some of you may know this but it's like an ice cream cone itself and it comes down to a point

and the leak was at the very bottom of the cone and we think it had something to do with some crit from PDF recycle got into there and some disparaging took place and probably thinned wall there that created that leak. In order to fix it the means we have come up with to do that we developed a hemispherical cap that is about two and a half to three feet in diameter and it's going to fit up underneath that cone and then be welded eventually around that and then it will contain that leak site. This all has to be done inside a hot cell so the way we are doing it is we have a robot, a brock device, some of you may be familiar with which actually supports a robotic arm that is used in the automobile industries. We worked with a company out of Detroit since a cocoa arm is programmable it fits on the brock and at the end of that is a laser powder injection weld head and it will support the cap up and underneath the cone. Again, this is inside a hot cell and the only access is from the top and it's about 35 feet in the air. We have to lower this equipment down in there remotely then arrange it to get the cap under there and then do the weld around what is left there. It has been quite an interesting trip; I was in Lynchburg two weeks ago where we were doing a full-scale mockup. We built a full-scale mockup of the cone itself and we have all the robots and we are testing that technology to make sure it will work before we come to the site to deploy it. So, to get to the end of the story and to answer your question the repair should be done in November. That is our schedule we have been working on it for a year and a half. We are in the final stage of affecting the repair. I hope to report on that maybe in the next meeting.

Dr. Van Brunt: So, the bottleneck in terms of operations is still just the Melter.

Mr. Foster: Yes, the Melter is still the bottleneck in terms of operations. We have been able to work around not having that 3H Evaporator we have another evaporator a 2H Evaporator and there is some other evaporator capacity at DWPF and other places. But we do have to get back on line within the next year by either repairing it or replacing it by the Spring 2019 in order to stay on our system. We have a little bit of time left to do that. The repair is the preferred option.

Ms. Hudson: Has the leak material been contained?

Mr. Foster: Yes, there is a sump inside the cell so anything that actually leaks out of the evaporator goes to the sump and is recycled. No material is released outside of the processes themselves.

Captain Cross: How many of the tanks are leaking?

Mr. Foster: That is a good question. I don't know the answer but a number of them have leaks but they are not actively leaking because the salt tends to heal the leak when it comes out and we keep the liquid level in the tanks below where we have some known holes and there is also a secondary containment around them as well.

Mr. Folk: Just for clarity those were the old-style tanks we have not had issue with double wall tanks. We haven't had any issues from that perspective and again that's why we are working on the tanks. We are keeping a focus on H Tank Farm where we have some older style tanks now at or near or in the

water table that's a primary focus of the tanks we are cleaning up. That's a guide in which tanks we are picking next to clean up.

Dr. Van Brunt: Thank you.

Mr. Lee: Congratulations on the budget. Who put the estimate together?

Mr. Foster: It was a SRR estimate. The companies that did most of the work on it within our team actually were CH2M and Bechtel National. They issue the design and Bechtel did a lot of the construction work for us. We work as an integrated team and that is part of why we bring in different companies.

Mr. Lee: It certainly sounds like from the presentation and from my visit down to your site that this has been a very successful program. Are there any areas that you are leaving that you think the next contractor needs to push to the top of the list for attention or is it just business as usual when they come in.

Mr. Foster: There is one. My personal view on the most important thing to do in terms of going forward is probably recovering and improving our training program. The training program at Savannah River was back in the early 1990s during reactor restart. Some people remember there was a huge influx of commercial nuclear persons that brought the standards up to a very high level. Very detailed training programs, conduct operations, systems understanding and safety basis understanding. Many of the people that went through all that in the 1990s and early 2000s are now reaching retirement age and we are hiring new people every day. We have a twenty-five and thirty-year experienced persons going out the gate every other day. That's how fast they are leaving, and we are bringing in someone who has never worked in the nuclear industry to replace them. So, we have to go back and recover some of those really strong training concepts we worked on. We put together a program to implement some additional training and Jim has been very supportive of it and getting that done. That will be one of my big points to turn over to my successor to continue that effort.

Mr. Lee: Any other questions? We wish you safe journey wherever you are headed I don't know if there is an announcement coming but congratulations on a great project.

H Canyon Down Blending, Tony Polk, SR Director, Nuclear Materials Program
(Slides available here <http://admin.sc.gov/node/1543>)

Question from Council:

Representative Davis: Thank you for your continued nonproliferation efforts. That's commendable and the world thanks you. I read recently that NASA was beginning to run out of their plutonium 238 for

deep space missions. Is that something that Savannah River Site at the H Canyon can pick up and do again for NASA?

Mr. Polk: H Canyon did provide those materials in the past. I know that there has been some called initial discussion about the needs moving into the future for NASA. As it stands today those materials are currently being produced elsewhere. Perhaps as the space program continues to evolve and especially to increase as we move forward in the Mars missions and other things that NASA has planned. If there is an increasing need there may be a look toward Savannah River Site to help with those materials again. As of today, we are not looking at that as a mission.

Representative Davis: Would you have to do a retrofit or anything. Would it take you off of the mission that you have already at H Canyon to convert to try to produce plutonium 238?

Mr. Polk: I don't know that I've got the full answer to that. The H Canyon is a big facility. There are areas of the canyon that can be utilized. In the past there have been special activities that were called frame activities for special production missions that went on that may be available in the future for other activities outside of the primary mission.

Representative Davis: Thank you.

Dr. Van Brunt: Plutonium dissolution sometimes in the past used not only nitric acid but also small quantities of hydrochloric. I was wondering because these facilities have not been used in a while exactly what the degree of corrosion is particularly associated with EHF?

Mr. Polk: Most of those facilities, most of the equipment associated with the operations activities are stainless steel because of the acid content that is used in the processes and that is primary nitric acid. Stainless steel is fairly resistant to nitric acid and therefore not susceptible to the kind of corrosion that other materials might be. However, there are in any materials where you are heating acid and you are flowing materials there is corrosion and erosion. We continuously evaluate our systems and the equipment to understand where they are in their cycle of use so that we can understand what we may have to do and a replacement to be able to continue to operate.

Dr. Van Brunt: I was thinking particularly because they were adding HF particularly to enhance the dissolution rate of the plutonium which is particularly difficult to dissolve, and I was wondering is that going to be continuing or do you know the answer to that?

Mr. Polk: The plutonium dissolution activities are on hold right now. What we have done so far in those dissolution activities we provide NNSA materials for the production of what they need as an initial introduction into the MOX facility. We produced and have enough in storage to be able to continue those activities. That is one of the reasons we are converting that dissolver now over to use for both NTR Fuel and Hyper Fuel, so we can get through those campaigns. We don't anticipate that moving into the future; but, to my knowledge even the introduction to the minor amounts of hydrofluoric that may

have occurred in the past I don't know they have created any concerns from a corrosion standpoint other than those we had anticipated.

Dr. Van Brunt: Thank you.

Mr. Lee: I understand the facility is quite old. Have you got a deferred maintenance list? I mean what is the status of your funding to keep the facility up? Should this be a target area for a line item funding out of Washington? I don't know how far down the facilities are.

Mr. Polk: It has been something that has been recognized and that Savannah River Site has put forward in its requests for funding to include dollars for infrastructure not only at the nuclear materials facilities but Jim's facilities and others as well. Those needs are still there. We have worked hard to be able to reduce the backlog of maintenance activities that we have by providing maintenance to the equipment that we currently have in place. As I said it becomes more and more of a challenge every day to keep those systems, some of which are fifty and sixty years old, on line and operating to support the mission. From a safety standpoint I will say this; the systems that support safety are priority, those systems are maintained and are kept in shape so that our safety basis is maintained at all times. Primarily the systems I am talking about are those that would be mission support related. Things like electrical distribution, tanks, valves, water supplies, those things that would be supply commodities that help to keep the mission moving forward.

Mr. Lee: There is another item on the agenda later having to do with some HEU coming home so to speak. As you mentioned you processed some products from Canada, there is some discussion about some coming from Germany. Would that material come to you and do you have the capacity for that sort of thing?

Mr. Polk: The German materials that you speak of and we have helped the folks in Germany to research and understand what could be done with so far. There has been no final determination because we have not looked forward quite frankly to how and where we might perform those activities. H Canyon is one of those if we were looking that has potential because there is room.

Mr. Lee: The current processes that you have in place right now, you would actually have to have a different process to deal with that HEU that comes from Germany.

Mr. Polk: That is correct and that is because of the form that it is in the graphite strips. I believe you are going to get some more information

Mr. Lee: I just want to get some idea of you as a recipient of it how you would look at it.

Mr. Polk: I will leave you with this; it is really amazing that the canyon in its design from the early fifties is as flexible a facility as it is. The way that it was constructed in particular the use of the Hanford

connectors and our ability to change the flows and paths and how we supply different equipment makes it a very flexible facility for lots of things.

Mr. Lee: Thank you.

Dr. Van Brunt: Do you have the capacity at the L Reactor or K Reactor sites to take the German fuel?

Mr. Polk: I believe that anything that has been looked at so far and the form that material is in don't require storage in the pool as does the materials we currently receive today do. Any storage of those would probably be in dry form and casks and therefore not comingled with the fuel in L area.

Dr. Van Brunt: Thank you.

Senator Young: In your summary, it says "we stabilize/disposition of nuclear materials to allow for de-inventory of DOE facilities and to meet nonproliferation goals." You mentioned just a few minutes ago in response to one of the questions I heard you say that plutonium dissolution is on hold. As to dissolution and disposition, are those different processes?

Mr. Polk: In this case they are. In the case of the dissolution I am talking about Senator are the materials that we took from H Canyon that would meet the MOX facility requirements for fabricating their fuel and we process into oxide form after dissolution to be able to meet their needs. That is the dissolution I am talking about. That disposition path ultimately that was considered though MOX is still there. It is different from other paths that are being considered. These are materials specifically dissolved and prepared for use in MOX.

Senator Young: Do you know how long it would take to disposition the plutonium that is at the Savannah River Site currently?

Mr. Polk: I cannot give you a specific answer to that because there are so many variables associated with that. That would include how it is processed, the facilities that would be built and what the throughput of those facilities might be able to process the plutonium stored at Savannah River Site, the method that we would use to do that, all of those variables play into any kind of determination as to how long it may take.

Senator Young: So, it is fair to say that right now, as of today, you do not have a path forward for the disposition of the plutonium stored at the Savannah River Site?

Mr. Polk: Other than MOX. MOX is the path at least for those materials that are MOXable at Savannah River Site. Other materials and we continuously down blending activities now that send materials that are the plutonium material that is the result of our inspection processes and destructive evaluation in K area. Those materials are currently down blended into a form that goes to WIPP for disposition.

Senator Young: Is WIPP being opened for that?

Mr. Polk: WIPP is receiving materials and has received some materials from Savannah River Site. I believe some of those materials include some of the down blended plutonium.

Senator Young: So, it was a year ago in this meeting in October 2016 when Mr. Pat McGuire was here talking about disposition of plutonium at Savannah River Site through a Down Blend Process and he mentioned it would be shipped to WIPP. On that day, he said he could not tell us when WIPP would reopen. But it has reopened?

Mr. Polk: WIPP has reopened and it is on a priority basis for receiving materials and has received some materials from Savannah River.

Senator Young: I think what I am hearing you say is that there has not been a decision made as to whether or not the down blend procedure would be an alternative to MOX?

Mr. Polk: To my knowledge but that is not in my purview. That is not an NNSA related activity and I really cannot speak to that.

Senator Young: Thank you very much.

Mr. Lee: So at this point none of the pit plutonium has been down blended.

Mr. Polk: Only through those activities that are involved with the destructive evaluations that we do to be able to ensure that storage of plutonium in those 3013 canisters in K area continues to be valid for the life that we intended it to be there. The materials that are taken from that are currently down blended and shipped to WIPP.

Mr. Lee: Thank you very much.

MOX Update, Robert Raines, NNSA, Associate Administrator for Acquisition and Project Management (Slides available here <http://admin.sc.gov/node/1543>)

Question from Council:

Mr. Raines: Thank you very much for giving me the opportunity to discuss the status of the MOX project today. I am Bob Raines I am the Associate Administrator for Acquisition and Project Management for NNSA. What that means is: I am responsible for all contracts and all capital construction projects that NNSA does. What I am going to be presenting to you today is the same

information that we have briefed the Senators Alexander and McCain, the Chairman of our authorization and appropriation committees and also to Governor McMaster when he recently visited the MOX project. There really seems to be I think a little bit of misunderstanding about this project. I just want to open up with a couple of contextual items. First, this is an engineering procurement construction contract which means we hire a construction company to do the design, procure all the materials, construct it, and start it up. When we did that back in 2008, I am sorry, back in 2008, we were provided a proposal that said we will build this for 4.8 million dollars (\$4.8M) and we will be done in 2016. The Department accepted that proposal. The Department's primary responsibility at that time was to make sure that we budgeted for and provided the funds in order to allow the contractor to build the project that they had proposed on. The Department in fact did do that. Every year we budgeted for the amount of money that was in the proposal. One year, the first year in 2008, Congress as you have heard earlier took a little nick. Shortly afterwards we negotiated an increase to the contract price of fifty million dollars (\$50M) to take care of the reduced cash flow even though it was very early in on the project we had just base lined the project, but we knew that would create some sort of turbulence. So we increased the project price a little bit. A lot of people say that we did not provide the funding particularly in the most recent years. So again, I want to be absolutely clear. In 2014, 2015 and 2016 the Department provided hundreds of millions of dollars more than was in the proposal. 2014, the first year, where people said we slowed the work down we provided about \$50M more than was in the initial proposal. And in 2015 and 2016 the budget was supposed to be about zeroed out. Yet, over \$300M was provided a year. So again, I just want to make sure everyone understands this project has been robustly financed by the Department. This is a cost-plus contract. All the performance risk rests with the government which means it rests with the taxpayer. This type of contract creates sort of perverse incentive. Contractors will give you a low number sometimes because they can do the work, get the work started and it's really difficult to stop something once you've been working. Now we sort of changed that in the Department we now require full designs before we baseline work. We do as much of our work fixed price as possible but that is not what we had done on this job. So again, I just want to give you the context of this. The last thing, this project has had more external reviews required by the Congress than any project I know. So, I know people say we need to have another external review. We had a federally funded research and development center come in and say you know the project was not going to finish on budget and that the progress that was being reported was optimistic. We had a red team headed up by the head of Oakridge National Laboratories, selected by the chairman of our appropriations committee and said this project is really going to cost a lot more money than anybody thinks. We had the Army Corps of Engineers come in and do an updated estimate. We had GAO validate that estimate. So I am going to talk a little bit about those things as we go forward. So the first thing is the MOX cost estimate. The cost estimate is really important because in construction we measure how complete a project is based on the budget. It's the way GAO measures, it's the way the American Association of Cost Estimators measures, it's the way the Department measures, and frankly is the way Congress wants us to measure because the House put in an earned value management system. We don't measure by how much pipe has been delivered or how much concrete is poured or the weight of stuff. What we do is say how much work has been done compared to your budget and then it is pretty simple. You divide what you have done by what the total cost is and it tells you how complete you are. So that is why it is very important to understand the rules behind measuring

performance. Our estimate is \$17.2B with completion in 2048. CB&I's estimate \$9.99B that was the last estimate they gave us when we were briefing the senators. GAO said that our estimate is reliable. That means it was comprehensive, well documented, accurate and credible. Now why is it important to follow GAO's guidance? Besides Congress having GAO come in to review every project we do if it goes off the rails. What their practices are is a compilation of all the industries best practices. So, they didn't just make it up, they went and saw what all industry does and say how should you estimate work to get a reliable credible estimate. And so, they reviewed our estimate. They said that it was reliable and credible. They reviewed the estimates that CB&I provided to us and they determined to not be reliable. While we were briefing the Senators, David Trimbull the head of GAO's estimating group was there and I said: David, if somebody doesn't follow your principles what's the outcome and he said it's always that they have underestimated it. Now that's what the Department has been criticized for in the past for not following their procedures. And you know we have a history of a lot of our projects coming in way over budget. We now use their procedure, that's the procedure we use on this project. When we didn't use their procedure, we agreed it was a \$4.8B project and \$5B and we still had decades of work to go. Inflation is really another word for what it is really going to cost to buy the labor and materials for the thing that you are going to do. We follow GAO's practice by following an index that most closely matches the program to be estimated. So, let's not just talk about construction because a lot of people don't understand it may be when in construction we say the CPI is 2%. Well think about health care or college tuition. My son is going to college. And I will tell you I know they say the inflation rate is 2% but my tuition bills are going up more than 2% every year. You have to look and see what you are buying. So, what we did we used a construction industries inflation rates. We look at engineering news records, the Turner Cost Index, and construction analytics and came up with a 4% inflation rate. We will provide you a handout later that shows you the details behind those. And in fact, in the construction analytics report we had found that CPI is generally half the amount of what the construction inflation rate is. MOX Services in their estimates used the general CPI rate which GAO specifically says should not be used. You should use an index that matches what you are buying. In the data that they had provided us from Global Insight they indicated on the sheet they had gave us that construction and engineering labor was going to go up a little more than 3% a year. Had they used that number we would have been closer to the 4% and probably a better indicator than the general CPI rate that was used. I have this last thing on here just to let you know that it's not just the Department of Energy. So when the Navy's ship building programs were significantly running over budget the GAO looked at them and they said you are just using CPI, you shouldn't do that. You should look at what the ship building indexes are and the Navy changed their policy to align with the exact policy that the Department has been using since I have been there.

Productivity Rates - So a productivity rate measures the amount of effort for a particular task. For example, I estimate it is going to take 4 hours to install a foot of pipe. Well if you don't hit your rate and it takes 8 hours to install that foot of pipe you not only double the direct cost of the work but now because these projects are finance on a cash flow basis as we talked about earlier you get less work done every year, the schedule extends, inflation starts to affect you more because I am going to be doing work five, six, seven years longer at increased labor rates and increase material rates for materials I have to buy. GAO says, and we agree the best productivity estimates come from the actual costs rather than estimating manuals. Now why is that? It's because actual costs incorporate all the

intangibles, the skill level of the craft worker, congestion of the site, working in 100 degrees and 100% humidity South Carolina's summers in cramped spaces. I lived in Goose Creek for a couple of year and I worked in Gulfport Mississippi and Pensacola Florida. I know what it is like to work in the South. You can't pick that out of a manual, you go, and you see what it's really taking and then that's what you will use when you say what I expect it to take to finish a job. The Department and our industry partners have found that MOX Services rates and prior estimates are unrealistic and unachievable. MOX Services appear to agree because they have used actual productivity rates in their latest estimates for FY 2016 and 2017; however, their 2018 through completion which is 2029 or 2030 in their estimate they went back to the production rates which they have yet to meet. Now I just want to explain why this is so important holistically. Again, I have a cost-plus contract, I own the risk. CB&I recently had a \$558M charge in some of their large gas plants, their CEO said that in large part this was due to lower than expected productivity by our direct higher workforce. So those were fixed price projects that they were doing with their workforce they owned that risk. Partially as a result they had to stop paying their dividends and that's appropriate. The company made a bad call. They are running over budget now they are trying to subcontract that work out fix price to shift the risk that's something we tried do on our project for quite a while. So, I just want you to understand how all of these things work together. You know when you are in a production rates and a cost-plus contract that are my risk. That is why I have to cover that in my estimate.

Schedule - So everything that I talked about relates to the schedule. The key to the schedule - schedules are really hard to understand on these large projects. I know that you have read some reports on some of these large projects going on here and they describe that the schedules were not logically put together, some of the work did not have successors, some did not have predecessors, they weren't resource loaded, and they didn't match the work rate down structure. That is what the Army Corps of Engineers and GAO found when looked at the schedule on our project. We put the schedule together as best we could to close those loops, to resource load, and bounded by the financing that was available. That is why our schedule finishes in 2048 not 2030. Again, if you don't follow best practices the result is the job will take longer. Not following best practice never means that it is going to be faster. Just to let you know how hard it is and how you really have to understand this in August of 2012 the Augusta Chronicle wrote from the MOX Services President quoting that "the project remains on schedule for completion in 2016". This was in 2012. Two months later they asked us for a three-year time extension. So, it's very important that your schedule accurately reflect the work that you are doing.

Obsolescence - Obsolescence is the only thing that there is not a GAO guidance on. Generally, these projects build out pretty quickly. This project was initially going to be a five-year build and a two year start up. Baseline in 2008 finishes it in 2013 and 2014 start it up in two years. Well you have been there. This project is full of high tech electronics stuff that is going to be in a sub-optimal environment for 20 to 35 years. We have stuff that has been out there for a decade already. We use this whenever we have a job that looks like it is going to extend we go ahead and build obsolescence in. And so we have estimated \$500M for this. We believe that is a reasonable amount. The CB&I estimate had no allowance for this, so they carried it as a risk. A risk is something you only get a little slice of we are highly competent there are some stuff sitting out there that's not going to work when we go and start this plant up.

So, in summary I think the latest estimate that we have put together which has been done by an independent entity, Army Corps of Engineers, has been reviewed and validated by the GAO to make sure that it was reliable and credible. I believe our number is good and our senior leadership has testified to that. Our contractor had good intentions in believing they could build this for \$10B. I think this is the same good intentions when they thought they could build this for \$4.8B when they first started. I just think the facts are not behind that. Finally, regardless of the cost whether is \$10B, \$17B or let's be frank it is going to be likely somewhere in between closer to \$17B. But what if it is \$14B or \$15B regardless this project is not affordable by Department of Energy. You all have just mentioned a lot of good things, a lot of deferred maintenance, a lot of work we have to do and it's unaffordable for us to continue. The Department is committed to meet our plutonium disposition commitments. We believe we have a faster, cheaper, proven way to do it. You just heard Tony Polk say we are down blending and shipping material to WIPP. WIPP is open. And we are confident that is the path to success to get the plutonium out of South Carolina as quickly and efficiently as possible. Thank you very much and I am happy to take any questions you might have

Mr. Lee: Thank you very much and we do appreciate you coming on such short notice.

Mr. Little: I guess this for me is like Deja vu all over again. I have to tell you I am pretty frustrated by this whole situation and I have doing this a long time about 45 years. And on both the commercial nuclear side and Department of Energy side this has been valid for 11 years. I know we always start these projects with good intentions and include budgets. But I have to tell you that we share some responsibility here. We have heard a lot about the contractor and the saying when I was at DOE we often time used an ALARA principle which was time, distance and contractors. But I think DOE has some responsibility here. A cost-plus contract, fast track, ok design wasn't done, estimate calculations. Anyone in the EPC (Engineering, Procurement, and Contracting) business, which I did for a long time, knows we are talking in ranges of 30% uncertainties when you start something like that. Productivity on the DOE side is nothing like productivity on the commercial side. Right now, the workforce has a 70% turnover rate. The contract does not allow to paying overtime, it doesn't allow for the payment of per diem. Yet it is in competition with a nuclear project across the river, so we tend to get young workers who come to get qualified at Savannah River and then they are going to drive over to the Vogtle Plant and get a nice job with per diem and overtime and they already have their qualifications. We have a big turnover rate that does hurt productivity rate when using junior staff. There is a shortage of construction labor that is experienced in the nuclear market. We have seen this on Vogtle; we have seen it on Virgil Summer. Not all of these facilities have been built over the years. If you look at other projects in DOE, treatment plant – in a lot of these projects there are probably few that came in under budget, probably Oak Ridge. But more often than not these projects carry these levels of uncertainties. So, you are going back to 2008 awarding a cost plus contract on a letter of credit financing and reimbursing that. You don't always get the full funding appropriation as you go ever year and you are developing cases and reprioritizing and doing those kinds of things. You have to make sure that you use it or lose it so the un-costed uncommitted carryover money you have to say I have money left in the budget now let's buy some materials we will stock pile and because the money will go away if we don't spend it on those kinds of things. You can go through all these things and fix the blame but I would

rather fix the problem. My real concern here is South Carolina's interests. Here we are 2017 with no MOX the state signs up for this whole solution we are going to get this plutonium out of South Carolina. In the days of Governor Jim Hodges wanting to lay in the highway and these commitments to move plutonium out of the state we are going to get this milestone, it's going to be \$1M a day up to \$100M. We would rather owe it to you than pay you. So now we are faced with 8 years \$5B and let's start over. Down blend is feasible, but it certainly doesn't have the level of design. You are going back to year one here so if we terminate this contract let's start and start playing this again going up the Aztec Alter for permission trying to get this budget reestablished meanwhile the plutonium sits in Savannah River. To have down blend it takes 2 years to train an operator to do down blend activity between hiring them, qualifying them, to do background and training 2 years. Just so they could start doing it. The glove boxes you would have to put in that area aren't designed or built yet. We have a small glove box that is not adequate for this stuff it is too much of a dose, multiple shifts. So, we are going to go through this so let's go back, let's start over, and let's pretend its 2002 all over again. So what assurance does the State have that this process is going to work? Now we have shipped plutonium to WIPP, about 70 KGs. We are talking about 3 or 4 metric tons. Can WIPP take this, can WIPP absorb this, do they have the space available, is there any adjustments on Land Withdrawal Act, does this material require special security arrangements and those kinds of things, and will we have to get permissions for these shipments through all those states to WIPP. What will NNMD want, what will EPA want, will those regular permits be required at Savannah River. We will have to go back and do this all over again and the public notes saying it's all over cross again. So, we are now at a point where oh we now have a problem we probably had the wrong kind of contract, and we had some labor issues. Now the thing about the obsolescence piece is a plug as McDonald knows. Most often they are put in the risk assessment that was 100% certainty. Nuclear plants take 10 years to build. I have never run into a technological obsolescence issue on building a nuclear plant that was this level of money. It almost seems like it is a lot of justification to just walk away from this thing. If it was a bad contract or the structure wasn't there it seems to be piling on to justify the decision to walk away in my mind. I don't mean to be impolite, but this is pretty frustrating. I remember the aerospace report that came out that talked about production uncertainties of MOX and the question asked at that time why is this discovered now? When you went through this process for MOX wouldn't you have known that production uncertainty for that and I ask aren't there facilities that produce this MOX fueling in the world – yes in France with the same technology. So, what is so special about the United States that these uncertainties occur here and don't occur in France? It seems like there is a lot of convenient kinds of things almost kind of circling around to justify this after the fact. I think if anybody is responsible where this project has fallen back I think it's all sides and not just the contractor. I think the Department of Energy bears responsible too.

Mr. Raines: If you thought that when I started out by saying that the Department agreed with this because we didn't follow the processes that we didn't do our due diligence. That is what I was trying to communicate in the beginning. That is what we have told lots of people. There is certainly blame for everybody when the project went from \$4.8B to where we are today. I do not want to go to point by point, but I do understand your point. But, two things I just want to make sure I highlight. The issue about overtime, that's recent, when this project first started there were no bounds put on that and the

contract just didn't finish. We spent the money and we didn't get it done. As the owner we had a responsible to ensure the taxpayer's dollars were being spent efficiently. I believe that you have read the report. You know when you say overtime attracts people I come from a construction family. Most of our EPC guys all work 48 hours a week, maybe 50 to entice labor but they don't like to do that forever. Most of my big jobs are not doing that. I know on your recent project that we shut down one of the items was work 58 hours a week, but people don't want to work that long you get 30 hours' worth of productivity for 70 hours' worth of pay. So, we made a valid assessment that said we would only approve overtime in those instances where it is determined that it is a good value to the taxpayer.

Mr. Little: Does it make sense to want to speed up work to start reducing the time available? The guys behind who want to catch up and use overtime you tell him no.

Mr. Raines: No not if you have the productivity rate, if you have got the productivity rate as I have mentioned if you get 30 hours' worth of productivity out of 70 hours' worth of pay you haven't sped up the work.

Mr. Little: What do you think in DOE's opinion is the root cause of the low productivity? Is it the skill of the work force, what is it, what is causing this?

Mr. Raines: I don't think it is the workforce at all, I just think it was a bad estimate as I said in the beginning.

Mr. Little: You have made a bad assumption there are standard tables of how many feet of conduit.

Mr. Raines: Yes, how many feet and then I have to work in these conditions, I have to work with these quality requirements, I have to work with engineering not done, you said it very eloquently the project started before all the design was done, and so all of those things lead into these productivity issues.

Mr. Little: Look I can understand the cost increases and how it happened. I am just a little concerned about the rationale for why it happened. You know we have a cost-plus contract and you know if they write it off they have thrown us back. That is irrelevant to say how did this thing happen, and the root cause of this thing is it is a cost-plus project. Did we know the cost was not finalized at that stage, they knew? If the design was finalized the contractor could have been much more assertive and negotiate a bigger deal. If I have the design done I don't want to go into a cost-plus mode, I want a fixed price proposal, so I will make more money. It's when there is uncertainty, which means the design completion, site conditions you want to be more of an open book cost plus environment. I just want to clarify that this should be no surprise. There should have been no surprise in 2008. Look at the track record of other DOE projects. They all suffered when you fast track these things and you are trying to use annual appropriations and get your CD zeros and ones aligned to get these things lined up and go. That's way this work tends to be. I am not saying it's optimal. But in 8 years and to say our answer is not to fix the problem our answer is to try to do something totally new with uncertain schedules about how long that might take. I mean you are talking a few hundred million dollars to put glove boxes in.

There is a workforce that is not trained to do that. We have workforce issues at the site. The guys that do this stuff are my age. They are retiring. Getting some of the work sitting hand mixing plutonium in cans is not a great thing to attract youngsters and train them through this kind of thing. But then in the end the conclusion here is South Carolina still hearing trust us this is going to take longer and how much longer, and I haven't seen anything to give me any confidence that this is a much better solution.

Mr. Raines: I think we would be happy to come in and talk with you and provide you some more detail as to why we believe that this is a better solution. One it is a process that we do today. People will be trained to do this. Right now, people have to be trained either in 2030 or 2050 depending on what schedule you believe to run the MOX plant. We are going to have to attract labor and train them. The MOX plant is a much more sophisticated plant than the diluent glove box method. We would be happy to have that discussion with you.

Mr. Lee: I have a bit of an issue a credibility issue and that is – I am familiar I read the Rand Report from back in 1999 I think it was. It was a clear awareness at the time with regards to the DOE's ability to try and use new technology on projects and the effect it had on budgets. So it is an old theme that the Department is well aware of and you look at the commitments that were made to South Carolina and these were made I presume in good faith that you were going to get a certain amount of plutonium out of the state, that you were going to pay \$100M a year cap for sort of liquidated damages, and you were going to build MOX. And today what we hear is you are not going to pay the liquidated damages, you are fighting it in court, you haven't taken the plutonium out of the state, and now you are not going to build MOX. History is littered with DOE projects where promises were made to local governments and it didn't happen. The Super Collider a case in point, the issues surrounding Yucca Mountain another case in point. All of these things create a credibility gap at least in my mind for me personally with regards to commitment to a new technology that is not currently being used that has all the variables connected with it that will invariably delay what occurs. I would be happy to hear about the new technology and the new methods that you propose to use but you should know that I am doubtful about the long-term effect of it. Usually what happens is someone comes up with a new idea that is very innovative, interesting and it gets approved, it gets started and that person moves away, and the people left behind don't have the same commitment to that program, and they have to do the hard work after the program is started. My fear is with your down blending proposal that we are getting down the same path for a decades long exercise. You know this is interesting enough; this year is the 60th anniversary of the first discussion of a high-level waste facility. And a fact this last March was the anniversary when the DOE said we will open Yucca Mountain March 31, 2017. I think you can see the sensation I have, and I am sure others have with regards with what you bring to the table. I am sorry I did not mean to take so much time.

Dr. Van Brunt: I don't understand this at all. If you put all of these facilities worldwide on a graph, the cost is only directly related to the amount of concrete in them. I am talking about wind scale, I am talking about all of the facilities in France, and I am talking about Hanford, Oak Ridge. The only cost that is significant is the amount of concrete. We have already put that concrete into MOX. If you look at the DWPF is there anything in the DWPF that represents the technology, the exact technology that was

proposed before the facility was built. Hardly anything is left, the chemistry has changed, and the amount of design has changed the entire operation inside. But we delivered that in a reasonable time frame relatively on budget and there is no reason why this facility has a certain amount of concrete already in place why you are projecting this enormous additional cost. The concretes in place so I want to know why this is so different than every other major nuclear facility of its type built around the world including the ones built in Russia. The first time anyone ever explained this to me was a DuPont cost estimator in the mid-seventies and every single thing that has been built since then, and everything built before then is basically totally aligned to the cubic yards of concrete. So why is this so different? Does this mean we are so much worse than France? I really have no idea what the basis for the enormous cost increases is – it just doesn't make sense to me. When you are talking about additional time for down blending – this is technology that exists, fine I want it next year in place. We should easily have that in place and be done very quickly. How come you can't do that? I have no idea why you are planning on going to that technology. It just doesn't make sense to me at all. I want the plutonium out of the State, I want this to be done safely, and I frankly don't believe anything you have said. It is just totally inconsistent with every other facility of its type that has been built in the entire world.

Mr. Raines: Well I would just like to say I I'm not sure what the DuPont engineer talked to you about but it's not only the way we estimate it it's the way CB&I estimated it, it's the way that every other project that we are building estimated it. Concrete is relatively inexpensive, so the real money is in the materials, equipment and labor to install it in the building. If I can make a simpler analogy you can go down and when you see a building that gets built. The building goes up pretty fast and then you spend all your time on the inside. That is where the expensive stuff is. I hear what you are saying maybe what they were explaining to you what they have is parametric estimates where they base it on the square footage but not just the cubic yards of concrete.

Dr. Van Brunt: You know that is actually BS.

Mr. Raines: No, It's not.

Dr. Van Brunt: That is completely BS because the DWPF...

Mr. Lee: Dr. Van Brunt

Dr. Van Brunt: and every one of the nuclear facilities we have the major cost is because the concrete is so high. Because the amount of concrete is so high it is very much different than building a building say in the Capital Complex here.

Mr. Lee: Let me move on down to the Senator please.

Senator Young: Thank you. I have several questions. Some of the stuff I want to ask is about this power point. In one of the first slides (slide 2), you mentioned the cost that was initially projected was \$4.8B. Is that the contractor's price in 2008? Is that a 2008 number or a 2017 number?

Mr. Raines: 2008.

Senator Young: Do you know what that has changed to in 2017?

Mr. Raines: What the delta is?

Senator Young: In other words, if that is a 2008 number, what would it be for 2017? do you know? If adjusted for inflation, what would that be today in today's dollars for \$4.8B?

Mr. Raines: I didn't do the math for it.

Senator Young: The numbers that your office are using? Those are like today's dollars, correct?

Mr. Raines: Correct.

Senator Young: Not 2008 dollars.

Mr. Raines: Well the 2008 was not in 2008 dollars. That was "then" year dollars using budget terms. That was "then" year dollars going all the way out to 2016.

Mr. Little: That was constant dollars, right?

Mr. Raines: No, "then" year dollars. We put our budget together. You are very familiar with the CD process, so when we made a commitment to Congress we said it would be \$4.8B in "then" year dollars spent by 2016. Now we are saying we believe it will be \$17B in "then" year dollars spent by 2048.

Senator Young: Is that the costs of construction? or is that the life cycle?

Mr. Raines: That is just the costs of construction.

Mr. Little: Is that constrained by annual appropriation?

Mr. Raines: Yes. That was based on a \$350M annual appropriation.

Mr. Little: Was that the original budget annual appropriation?

Mr. Raines: The original budget, the average for the life of the project, the original life was \$357M. We started out low as normal and do we have a bell curve and then we would come down. When we have a job that takes a very long time, you mentioned Hanford. So, the Hanford project you flat fund it. Well that one has been flat funded for a long time to provide funding stability to the budget offices.

Mr. Little: To Congress?

Mr. Raines: Yes sir.

Senator Young: You mentioned several times about problems with the contractor. Have you considered terminating the contractor?

Mr. Raines: You know that's something that's a procurement item. I would rather not discuss today.

Senator Young: Do you have the ability to do that?

Mr. Raines: Yes, we do.

Senator Young: Has the contract been reentered into with that same contractor since 2008?

Mr. Raines: So, this is a completion contract and so we don't have to reenter into a contract, the contractors continue until completion.

Senator Young: You said that this was a cost-plus contract. Were there other arrangements that could have been entered into in 2008?

Mr. Raines: Yes there could have been but as the gentleman mentioned back in those, I entered the Department of Energy back in 2011, I brought the methods to acquisition that I had done in DOE which was you finish a design, you get a fixed price contract, I have done \$1.5B worth of work over the last five years, 5% under budget. We have some of it fixed priced, some it we still have cost plus, but we put provisional fee and incentive quality acts. That's not how this contract was done. The reason that I brought that up again is not to make it as an excuse, just to lay it out as a fact that was the way the contract was. We would not enter into a contract like this today.

Senator Young: So, recognizing that, it seems it would be more prudent to look at a way to redo the contract and come up with a different contractor? It appears you are going down a path that -- as I understand it from the testimony we had a year ago in this meeting -- it would take quote "quite a long time at current capacity to disposition plutonium using glove box method." And in that meeting it was said that it could be a half a ton a year and it is my understanding that in August of this year in the lawsuit that's filed, there is a chart that DOE provided in which it said the amount that could be disposed of through the glove box method is 200kg a year which is obviously 40% of 500. At that rate, it would be decades before this stuff would be disposed of using the glove box method.

Robert Raines: Yes sir, you asked me two questions. The first one is have we considered redoing the contract. Yes in fact we have requested a fixed price proposal but we were told that it was really a little bit too risky to do this project on a fixed price and so the Army Corps of Engineers did a report and the report was sent to Congress and they recommended that if we were to proceed with this project, we

should convert to a fixed price type contract. In that report, they said if you could not negotiate a fixed price contract, they recommended a re-procurement. So, we have looked at that. There is a report that has been submitted to Congress that the Congress is currently reviewing. The second part is we don't disagree it will take decades, but the current program will take decades. It will take more decades to build, so regardless and then it will take several decades to run the MOX plant. This is a decades long process either way and the Department's position is we can start it much faster by using a current technology that is not a new technology, something that we are doing today at Savannah River. We can start down blending this material today and start moving it out of South Carolina faster than completing this project that we don't believe will be completed until 2048.

Senator Young: You said it would go to WIPP. I think that was the last thing you said in your formal presentation and that would be the best way to get it out of South Carolina as efficiently as possible. Is that right?

Mr. Raines: I didn't say it would go to WIPP; currently we are sending material to WIPP. The initial tranches of this material will go to WIPP.

Senator Young: So, you are saying we don't know for sure how much of it is going to WIPP when it leaves South Carolina?

Mr. Raines: No, I think what people confuse is the full 34 metric tons and the material that is in South Carolina. The material that is in South Carolina is significantly less than 34 metric tons and so the item about WIPP capacity has to do with the additional material that is not in South Carolina that the Department is committed in disposing of as a part of our nonproliferation agreement. So, the 34 metric tons is separate than the smaller amount of material that is in South Carolina.

Mr. Little: But all of this material is supposed to be processed through MOX previous commercial nuclear fuel. Thirty-four (34) metric tons this is a good idea to use this mixed oxide fuel in commercial reactors and yet \$50B in economic benefit, no carbon emission energy, this is how this project was designed. H Canyon is the only facility in the US that can do this. So where else would the remainder of the non-South Carolina plutonium go? Well if you're from South Carolina sitting here you kind of look around saying it looks like this stuff is coming here which is exactly what happened in 2002 when a former Governor said wait minute. This looks like the end of the road. If I have a long project the way the center is talking about you are exposed to a big window of risk. Things get delayed, there is lawsuit filed, permits filed, there is capacity issue of the Land Withdrawal Act, and if it's here it is staying here until that's resolved. So, the repository becomes South Carolina is what we all wanted to avoid from the beginning when this project was first envisioned. So that's the concern.

Mr. Lee: I have one question; it is my understanding, and this has to do with current operations, it is my understanding that your staff is working to a policy of **manage to termination**. Can you explain to us what all that affects and what it is?

Mr. Raines: So, my staff is not **managing to termination**. What my staff is doing is exactly what the latest appropriation bill says. We are continuing to construct this project.

Mr. Lee: But that is not what we were told by your staff.

Mr. Raines: Well either they misunderstood your question, or you misunderstood their answer. I have talked with them many times. We are constructing this project in accordance with the law as it is passed today.

Mr. Lee: But we were told that **managing to termination** was a strategy being used at the site, there were three of us that heard it, and it was very crystal-clear question just as I am asking you right now. That this **managing to termination** constituted an effort to restrict expenditures or to make sure that expenditures were ones that were only critical path or that didn't in the future when Congress came in line with your perspective on the contract you wouldn't catch questions about why these expenditures were allowed or why were they pursued. It raises the question how much carry forward money the project is holding and why that is not being put into the project for spending on the work. All of these things, the restriction on overtime, a new restriction, the difficulties recruiting employees, the fact that your organization has been telling the public we are going to terminate this project. They have created a large problem for the contractor both from a staffing and morale point. But, for myself, having heard that this project is being **managed to termination** I just want to figure out how you reconcile that against the instructions of Congress to spend the money and build the project.

Mr. Raines: So again, I wasn't there so I don't know exactly what they said, I would be happy to talk with you after this, so you can tell me who mentioned that, and I will make sure that they understand what the Department's position is. We will construct this project as efficiently and effectively as possible while we have been told to construct. So, under that guidance of course we are working on the critical path work because that finishes the job as quickly as possible. Of course, we were working overtime only in those areas that it makes economic sense for us to do. So, if they have a misconception of that I will be glad to make sure I discuss that with them.

Mr. Little: It is a common term here **manage to termination** with this expectation. This thing is so far in the ditch this isn't going anywhere and this dilute method slowdown boys and that term is common vernacular there. Also, in terms of the critical path actually what we saw being done there is only work on the critical path is being done. And you know, you have been in this business, you don't only work on the critical path, you manage by the critical path, but you have to have a parking lot. I did Department of Defense work, I built schools and police stations in Bagdad, fixed price and made money and they would blow them up and I would come back and rebuild them again it was renewal projects. So, I understand DoD. I understand where you are coming from here but when you get that environment in the media and hearings and all that stuff the workforce knows how to read and they hear that vernacular is in the hallways there **manage to termination** and the contracting officer saying well you have a mother may I if you want to spend something more than about \$100K you have to come talk with

me. I don't know of any project that does that, so the clamps are on and it may be because you are not satisfied with the contractor's performance but putting more constraints on a contractor that you want to hurry up like no overtime or only critical path is almost counter intuitive to me. If you want him to recover, where is the recovery plan, where is the request of the contractor? Hey, look I have a big deviation here what is your plan to recover and use that contract as leverage. I can term for cause here, these issues started happening about 5 years ago. So, what was the Department of Energy doing in that interim period when this started drifting off and productivity was low. Where was that action? That was my frustration earlier when I was saying this is like watching a movie of something that has already happened oh where were we, so you see where I am going?

Mr. Lee: The pending layoffs at the project – what is the cause of the layoffs? It is my understanding that the NNSA has given some direction to the contractor and there will be a layoff that either has occurred or will occur shortly. Why are they laying people off when there are bountiful places to work and there is \$180M sitting in carry forward money?

Mr. Raines: So I think that will be a question for David my understanding is they provided their execution plan for this year, we approved the execution plan for this year and you see this on many construction projects as certain work activities are finished, you decide certain work activities are not as important as others, again this is a cash flow project, they will make a decision as to where the appropriate labor should be. We have not limited, we have not said we don't want this craft or that craft, we approved their plan.

Mr. Little: So, this is their normal staffing.

Mr. Raines: David, I think, would be the best person to talk about that. I know again on this project as you know sir we are always hiring people, we are always letting people go, people are attriting at a rate they will have to replace them at.

Mr. Lee: So, I will turn this over and you will have the last word in just a second. I wanted to touch base on what I felt like was needed at the site and other members that went down to the site and that is we didn't fill the numbers you were looking at, looking at the buildings we were walking through. We felt that your numbers were too high, and it was too long. We looked at the numbers the contractor had frankly some of those could well be low. That was the consensus of the group it was our view that there should be a rebase line for the project and we suggested that a number of times with an independent body. I raise the subject of the independent body because you have cited a couple of times of outside consultants and there have been problems with the South Carolina Delegation documented in the letters they have sent out that they felt some of the study work had undue influence from the NNSA. So, my suggestion is to try to find a group that can do an independent assessment, find out what those numbers are, get the two sides to agree and then you can make your business decision as to whether or not that cost, and that duration compare favorably or unfavorably with diluent and dispose. I don't think you are there. That is my opinion so no reply is necessary.

Robert Raines: Thank you I understand that.

Rick Lee: Senator last questions.

Senator Young: I just wanted to first say I would be remiss if I didn't thank you for being here. And the reason that I want to make sure that is in the record and in the minutes is because we have made the request before. In fact, Karen Patterson, who was the previous chair for the council, and I had requested I believe in August of 2016 that someone from NNSA come to the October 2016 meeting to present on MOX and that did not happen. So, I want to publicly thank you for coming today and making this presentation and for taking questions from the council. Another question I have is you are fully aware that Congress before the project was started there was legislation that was enacted that is in Title 50 of the United States Code (Title 50 §2566(c)(2)) that sets in place dates for which there is supposed to be plutonium shipped out of South Carolina and one of the dates that is key is January 1, 2022. As we sit here today, can you tell me or tell the council what is being done in order to meet that January 1, 2022 deadline that is in statute for having all of the plutonium shipped out of South Carolina?

Mr. Raines: So that's not in my area, I am the MOX project person, I am not trying to dodge you sir; but, it's just something I am not familiar with.

Senator Young: Who would be?

Mr. Raines: That would be the nonproliferation group and we could arrange to speak to you on the details of what the Department's plans are going forward.

Senator Young: That would be with DOE or NNSA?

Mr. Raines: NNSA the nonproliferation group.

Senator Young: I think that we would want to hear from them on that. It is a very important issue that is coming up in a little over 4 years. An additional question I have is you have mentioned WIPP – do you know whether or not WIPP has the capacity for the amount of plutonium that would be in South Carolina and to be shipped to WIPP ultimately?

Mr. Raines: My understanding is that there is sufficient capacity at WIPP to take care of the plutonium that is in South Carolina.

Senator Young: Has the State of New Mexico approved that?

Mr. Raines: So, we have a record of decision for 6 metric tons of it and we have an environmental impact statement for the remainder and so I believe that is fine. But again, the very specifics are not an area of my expertise but those two things I told you are in fact factual that we have a record of decision

for 6 metric tons and an environmental impact statement for the remainder of the material that we have here.

Senator Young: Fifteen (15) years ago when the project was in its infant stages in 2002 there was a report that DOE sent to Congress in which it said that the construction of the MOX facility would be the, I am paraphrasing, but the MOX facility would be the best method by which to down blend in order to dispose of this plutonium consistent with the Russian Treaty. That was 15 years ago. So my question to you is that other than the projected cost of construction of this facility, is there any other reason why the Department of Energy's and NNSA's position would have changed as to the MOX facility being the best method to dispose of the material and to comply with the Russian agreement?

Mr. Raines: So, I want to clarify a couple of things. There is no treaty. The PMDA is an agreement that is an Executive Branch Agreement, so it is not a treaty. The second thing is there has been changes to that agreement made already so what they did 15 years ago, the Russians in 2010 I believe said we don't want to do this thing we want to do another thing and we agreed with them. And then as it went along there are a variety of policy issues that went into the determination that the MOX approach is not the desired approach. Cost is certainly one, but there are other policy issues that our policy people have talked about, again that is out of my area of expertise. But I just wanted to make sure that there is no illusion that whatever people signed up to in 2015 that they are doing today. In fact, most recently the Russians have suspended their compliance with the PMDF. The Department though is 100% committed to still disposing of its 34 metric tons of excess weapons grade plutonium. So that is the Department's position and the Administration's position and I believe that position is supported by everyone.

Senator Young: What can you tell us today that would make the State of South Carolina feel better about the Department honoring its commitment to remove all the plutonium from this state by January 1, 2022?

Mr. Raines: I don't know about 2022 but I tell you that my boss and the Secretary have testified and they are both committed to removing plutonium from the State of South Carolina and it could be possible they testified that they believe after seeing all of the data and facts, which I will be happy to share with you, that they believe the dilute and disposal alternative is faster, cheaper and that we have proven we are already doing it and we will get the material out of South Carolina faster.

Senator Young: Apparently there was a document provided in court which said the amount that could be taken out of this state is roughly 200kg and I have seen some media reports, and I know it may be a classified number, but I know you said a minute ago that you got in New Mexico permission for 6 metric tons?

Mr. Raines: We have a ROD -- a Record of Decision -- for 6.

Senator Young: So, to remove 6 metric tons at 200kg a year is 30 years. Is that right?

Mr. Raines: So again, I don't know the report you are talking about. I think it would really be worthwhile for us to bring forward to you what the plan is to install some additional glove boxes in order to speed up the removal of this material. Why am I confident of this; installing glove boxes is not hard. We have a facility that we can install glove boxes. I just finished a \$200M glove box job, \$4M under budget, at Los Alamos. I just finished another \$100M storage facility, has CAT 2 nuclear facility \$2M under budget. The projects that kill us, you are shaking your head, I know you know what I am going to say.

Mr. Little: I am amazed you got done under budget.

Robert Raines: Multibillion dollar multi-decade projects with the uncertainty. This diluent dispose is installing a couple of glove box lines which we all know how to do, The Savannah River folks do it well, and they have done it before. And then we take those people who are already down blending today and we let them down blend this material. And now I understand I am very confident in that. This is not a new technology, it is something we do all the time, and it is a 95,000 square foot facility with over 300 glove boxes that have to all operate in sync. It's a much simpler shake and bake material.

Mr. Little: You know this facility wasn't built over 40 years in France.

Mr. Raines: I wasn't going to bring this up but I ask you, when they built that thing 30 years ago one of the problems was, you guys have seen it you have read some of the reports, someone said we are going to build some nuclear power plant because this is how they are built overseas. And when you try to build them here using today's standards.

Mr. Little: And DOE.

Robert Raines: No these are built in the private sector and NRC. If you would look at Flamanville and Ohmacuto decades behind schedule, double and triple the price from the same people. What I am saying this is an artifact of the complexity of work today and the understanding of the building codes and standards today.

Mr. Little: That's fair.

Mr. Raines: So, I think that is a fair statement.

Mr. Lee: So, one last item having to do with WIPP. There was a GAO report that came out recently, I don't know if you saw it, where they said that WIPP would absolutely have to be expanded for the volume of material just from the DOE sites that is not plutonium weapons grade would require additional space. Did you see it or was that in error?

Mr. Raines: I read the GAO report. Here is the issue on what WIPP is the repository for all true waste in the entire Department. What some people misunderstand I think is if we build MOX 8,000 cubic meters

of MOX waste goes to WIPP. So WIPP is necessary for whatever disposition path and so if WIPP has a problem and we believe the WIPP Issue is resolvable. If the WIPP issue is not resolvable then MOX does not have a disposition path either sir.

Mr. Lee: The product that came from MOX would be a waste product and that would be the question in regard to weapons grade plutonium.

Mr. Raines: Yes sir. There are 2 products and so they have the fuel assemblies but when you make the fuel assembly it generates a waste product that's true waste and that's what goes to WIPP.

Mr. Lee: I understand. The other thing is the issue of administration changes worries us all here with regards to what the future holds. Let me ask you a question. If there was an administration that came who had serious budget problems worse than we have today is it possible they could make a decision, simply to leave the plutonium sitting where it is.

Mr. Raines: That is not a question that I could ever answer so I won't. Here is what I will say to you on administration changes. I have been around since Regan, I have done a lot of administration changes and what we find is if the facts are behind you then the policies will generally stay. If the new administration review things we had two administrations look at this project the prior administration said it's too expensive and it's going to take too long we have a better, faster, cheaper way. The new administration came in and they testified and said we put the career staff through the ringer; we wanted to make sure this was right, and they went through it and then the new administration came to the same conclusion. I believe that good leadership looks at the facts and then says what in fact is the best way to take care of this important mission that we have to do.

Senator Young: Mr. Raines, you said when I asked you about the fixed price proposal, you said the Army Corps of Engineers had recommended a fixed price and if it could not be negotiated then they recommended NNSA send it to procurement?

Mr. Raines: I want to be clear; they said that we should consider. I do not want to put words in their mouth. We should consider a re-procurement.

Senator Young: Ok, do you have a deadline when to get a fixed price proposal?

Mr. Raines: We are waiting the outcome of the current appropriations process to make a determination, as you know the Department's position was terminate the project if Congress tells us to continue to construct then we will continue to construct and then we will request a fixed price proposal to complete that construction in accordance within recommendations made to us.

Senator Young: I thought the instructions last budget cycle were to continue to construct?

Mr. Raines: Well yes, the last two budget cycles were to construct, the last budget cycle they said construct and to have the Army Corps of Engineers review your contractual approach.

Senator Young: How long will it take to get a fixed price proposal? And if that can't be negotiated, then how long will it take to have a re-procurement?

Mr. Raines: Sir, those are some procurement items that I am not at liberty to discuss with you today, but we could do that relatively quickly.

Mr. Lee: Thank you very much. Mr. Raines, we appreciate your coming.

Mr. Raines: Thank you I really appreciate it I knew this wasn't going to be a lovefest, I got it.

Mr. Lee: Well I will tell you what I will give you two of these lapel pins.

MOX Update - Project Status, David Del Vecchio, President and Project Manager, CB&I AREVA MOX Services

(Slides available here <http://admin.sc.gov/node/1543>)

Question from Council:

Mr. Lee: I am sorry to interrupt you, but Mr. Folk has an announcement he would like to make.

Mr. Folk: I have an announcement to read: The Department of Energy today is awarding a contract to Savannah River EcoManagement, LLC for Liquid Waste Services at the Savannah River Site. The members of EcoManagement, LLC are BWXT Technical Services Group Inc., Bechtel National, Inc., and Honeywell International, Inc. The estimated dollar value for this procurement is approximately \$4.7 billion with a ten-year period of performance which is a seven year base period and a three year option period. The liquid waste services include but are not limited to: operations of existing radioactive liquid waste facilities for storage, treatment, stabilization, and disposal of waste; waste removal from tanks and tank closures; construction of additional saltstone disposal units; operation of the Salt Waste Processing Facility after facility commissioning, startup, and one year of operation; and liquid waste program and regulatory support.

Mr. Lee: Thank you very much. You heard it here first at the council meeting. Congratulations to the winner and we look forward to some years of good success and strong performance for you.

Mr. Lee: We heard at a presentation earlier with regards to a 4% continuing rise in costs for the site. Would that 4% be focused more heavily in the procurement of steel, computers, conveyors and all that sort of things, glove boxes or would it be more aligned with labor?

Mr. Del Vecchio: Well I am going to be honest to tell you I would like to see the data. I know it was committed to get that information. We would all like to see that I understand what that number is. I have a piece of paper here that talks about over the last ten years and this is for labor. The lowest number on the page was about a 1.2% and for the disciplines that we have the highest number is 2.8%. So I don't have any indicator, I am not debating whether it is true or false but I would like to understand where that come from whether it is mainly from the labor force; is it mainly in the procurement arena and is it a blend across all of them because we have many different components that you have look at.

Mr. Lee: I raise that question because I was listening to you and you said you are 80% bought out.

Mr. Del Vecchio: Correct.

Mr. Lee: on all the procurement. Which means there's still some materials and equipment that will have to be purchased. But if the primary driver for labor is in that category you are looking at 25M hours to go and only 20% of the total procurement. I would be interested to see the relationship between that 20% of the procurement its anticipated costs and labor the numbers that you have now and see what kind of real inflation rate would come from that exercise.

Mr. Del Vecchio: We can do that.

Mr. Lee: I have to tell you in my employed life I would have been glad to have a job that gave me 4% every year. I haven't seen many of those. I think it would be a good exercise and would be enlightening for everybody.

Mr. Del Vecchio: Will do.

Mr. Little: Can you talk about the productivity a little bit for me because we hear low productivity. Was it assumed productivity or what do you think this whole productivity topic

Mr. Del Vecchio: I assume you mean unit rate performance. We didn't just come up with this on a whim or a napkin. We are a company and an organization that does a lot of this type of work. We were involved at both Vogtle and Summer when they were active CB&I was from our former Shaw days. AREVA has a lot of experience in this area as well; but we have also reached out to industry experts and some companies that do this and pull and call this type of data and look at dozens of plants. We use that as a backdrop and a guide. We also take into account our actual performance and that was mentioned earlier. That does become a factor in how we perform. The one thing I caution folks on is I can't believe that we would continue to operate with the poor performance we are seeing today in actual unit rates with folks who a coming in who have zero construction, zero MOX experience and zero nuclear. They are fresh out of high school. We don't mind being a training ground. But you are starting from the ground up and that has a huge impact on your unit rate performance. We assume in our out years that a decision is going to be made we are going to have certainty and a sustainable project and

then we can count on a reasonable improvement. I am not talking shoot the lights out in something we can't achieve. I am talking about something that is reasonable and within the bounds of those data points we have from this vendor that supplied information.

Mr. Little: So just so I can understand, it is more of the skill of the craft than the complexity of the facility design because at Vogtle productivity issues were this is a very complex piece of work here, huge modules and a lot of that stuff and you are saying you have the B players here because you can't attract the A players.

Mr. Del Vecchio: I don't want to give the impression we don't have complex work because we do. The further along we get the more complex and congestive and impact it gets. The one thing that was mentioned earlier that I can refute is I have the data to support it. We do take into consideration that it does get harder to put ten feet of pipe in when you've got ninety percent of the pipe in that particular room. Those were all factors that went into the process to develop the unit rates.

Mr. Little: So, when you did this project were you evaluating labor risks by doing labor surveys. We knew the Vogtle plant was going to be built, right.

Mr. Del Vecchio: We did but we also believed that we were going to be able to compete and at one point on the project during my tenure there we were able to negotiate and get a \$5.00 an hour up tick for welders of any discipline so that we could compete and at least have a level playing field.

Mr. Little: Well these are Davis Bacon Wages, right?

Mr. Del Vecchio: Yes.

Mr. Little: Which are union wages anyway so Vogtle structure has got to have the same wage structure.

Mr. Del Vecchio: When you throw in per diem and sixty to seventy-two-hour work weeks suddenly you are not competitive.

Mr. Little: It is the potential to work that and you don't want to work them like that until they either leave or drop dead.

Mr. Del Vecchio: We didn't do them like that in the past when we had the ability to work overtime. We were running about ten percent when we did have control of the overtime.

Mr. Little: Did they look at Vogtle as having more of a certain outcome than they would MOX?

Mr. Del Vecchio: Yes, absolutely.

Mr. Lee: That this may only last six months but if I go to Vogtle I may get a couple of years out of it.

Mr. Del Vecchio: Or more.

Mr. Lee: So, I heard you mention the number 3,000 as the number of people you could work and there is a sizeable amount of money being held back at this time. So, it is my understanding I would like to know why you are having layoffs?

Mr. Del Vecchio: I am glad you asked that question. One hundred and ninety-four crafts have left the project in the last three weeks. All of that is attributable to the change in the fiscal year 18 execution plan. Why did we change our plan? Because we were directed, and it came across as guidance in three different letters from the contracting officer to follow, I call then twelve points of light, there were twelve bullets between these two letters that told us what we were going to work on in fiscal year 18. That work scope could not be supported with the number of craft that we have on the project, so we had to do layoffs. It was directly attributed to the work that is being performed in fiscal year 18.

Mr. Lee: Mr. Raines mentioned the funding for the project at \$340M a year I saw a piece of paper here that had some examples of a blended funding of \$600M per year funding and then the \$340M. Those were the three cases I saw. It showed that every time you get a \$340M funding from Congress that it extended the project and increases the project cost based on what I saw on the numbers. Can you explain why that is?

Mr. Del Vecchio: Well sure, escalation is a factor. If you are performing at \$350M versus what was baseline in 2012 it is going to take longer, and escalation is eating up more of your dollars than are available to do real work. I would tell you we just submitted an estimate of completion to NNSA that we were directed to do at \$350M a year, which we did, and it demonstrates, again this is our opinion, and we put it in writing that we can do that and get through construction completion and cold startup by 2029 at \$350M per year.

Mr. Lee: What are the issues that would keep you from doing a firm fixed contract?

Mr. Del Vecchio: There are a number of them. We would have to have in terms of what about the risks we don't control. We have posed numerous questions about doing a fixed price or a fixed price type contract and we did not receive answers on those questions. We were accused of kicking the can down the road and that is not true. We would like to see MOX finished but we have to have either certain aspects of doing the fixed price work taken off the table and held by NNSA. They have to own certain risks and then there are risks that we will own. We have signed up to and answered the questions as proposed by the Army Corps of Engineers and the recommendation we felt were very responsive to those questions and we are prepared to have the discussions. I think we need to proceed with all of the recommendations of the Army Corps of Engineers. Right now, we are doing one of them which is a kind of construction slow down and finish a lot of things we had started but we haven't been requested to go re-baseline.

Mr. Little: So, you are talking about a hybrid kind of contract which has certain elements at fixed price and some with escalation. I think that is the Vogtle contract.

Mr. Del Vecchio: I don't know much about the Vogtle contract but that is what we are talking about.

Mr. Little: Is it realistic, I heard the thing about the Army Corps of Engineer said you would do lump sum. Even in the original estimate of about four of five billion dollars do you know of anyone that does lump sum contracts of that magnitude?

Mr. Del Vecchio: Not typically, no.

Mr. Little: I mean it is still in business.

Mr. Del Vecchio: Another concern is because we all need to be concerned about the taxpayer's dollars it could end up costing all of us as taxpayers more money because we have got to plan for and adjust the costs for those risks that are ours in that analysis.

Mr. Lee: The productivity thing is still an issue I am unsettled on. When I was at the site and had the opportunity to talk with the NNSA folks they indicated to me they had welding crews that only got one weld a day which seems extremely low. I saw where many of the welds were to go that were highly congestive, but it seemed abnormally low to me. Based on your information is that true for production levels for welding crews?

Mr. Del Vecchio: I would say the majority of our welders are getting a couple of welds a day but part of that is having adequate work fronts out ahead of them and knowing what their planned work was. We don't necessarily have them lined up to do two welds a day five day in a row because they do other fit-up activities and they are also enjoined in the final attribute work which we do to get the final closure of a particular weld.

Mr. Lee: Does a welding crew constitute one welder or several welders, what constitutes a welding crew?

Mr. Del Vecchio: Typically, a welding crew is one fitter and one welder, so the crew is two people. We have a person doing the fit-up and assisting the welder and the welder welding it out, so those welders is getting a couple of welds a day.

Senator Young: Mr. Del Vecchio, thank you for being here.

Mr. Del Vecchio: Yes Sir.

Senator Young: You said that the workforce turnover as I understand it is 10% when you control the overtime? What is the percentage when you don't control the overtime?

Mr. Del Vecchio: What I was indicating is right now we have only been authorized to work by my math works out to be about 1.5% overtime. So, there are very few people who work overtime. Within our craft, that's driving about 73% turnover amongst the craft. When we were controlling the project and we weren't excessive and we weren't working sixty and seventy-hour weeks, we would typically work fifty. We were allowed to do a couple of pilot projects where they allowed us to work overtime. We had to demonstrate that we got good weld production, we got good unit rate performance, and we did that over the course of an entire year working a crew at just forty-eight hours a week and we had zero turnover. I can't extrapolate and tell you exactly what it would be. The point is we also got people back from Vogtle and Summer because they were burned out because they were working too much overtime. So, I can understand the point you can overwork people and burn them out. Our point is we didn't do that in the past, we were working a reasonable level and it allowed us to maintain a stable workforce within the pockets where we could do it.

Senator Young: So NNSA has placed a restriction on overtime and procurement?

Mr. Del Vecchio: Absolutely.

Senator Young: One and one-half percentage of your workforce is eligible for overtime under the current restrictions?

Mr. Del Vecchio: Correct.

Senator Young: What percentage of the project can your company complete in a given year at a \$350M budget with the overtime restrictions that are currently in place?

Mr. Del Vecchio: Roughly I would say about 2% maybe 2.5%. We were previously getting close to 5% to 5.5%.

Senator Young: If the overtime restriction was not in place and you had the same budget of \$350M, what percentage of the project could your company complete in a given year?

Mr. Del Vecchio: Five percent.

Senator Young: So, you are saying before this Council today that you believe your company could nearly double the amount of work that is done within the same budget if the overtime restriction was not in place?

Mr. Del Vecchio: Correct

Senator Young: In a given year?

Mr. Del Vecchio: Correct.

Senator Young: You mentioned V.C. Summer. We all know what is happening at V.C. Summer. Over five thousand workers are not working there that were working there at the end of July. Have you seen an influx of applicants to your job site from the V.C. Summer project?

Mr. Del Vecchio: Absolutely.

Senator Young: Are you seeing an influx in the type of skilled workers that you need to complete your project?

Mr. Del Vecchio: On the non-manual side correct that is non-craft. On the craft side not so much.

Senator Young: Do you have any explanation why?

Mr. Del Vecchio: The SCANA job is nonunion and that was a hurdle, but we worked very closely with the business agent. I don't want to label anyone, but I don't know too many construction craft that are content with forty hours a week and that has been a drawback on them coming to MOX because that is all they are going to get on the MOX project. We have had better success with non-craft hiring.

Mr. Lee: One point to make here is that your area as I understand it is not flush with a lot of craft employees, geographic area.

Mr. Del Vecchio: Correct.

Mr. Lee: So as a result, the people who are craft who are coming to your site are largely travelers.

Mr. Del Vecchio: Correct.

Mr. Lee: They have to somehow find a place to live, pay for it and all of that. I used to do this stuff, I did big shutdowns for years, and HB Robinson we did 12 hours a day, for 18 months. So, the guys would come, and they would have to have a differential to offset the cost of their accommodations and sustaining them at the project and then have some bonus above what they could make doing forty hours where they lived. That's the delta.

Mr. Del Vecchio: So, both Vogtle and Summer it did not matter whether they were unionized or not were paying per diem and they were paying folks seven days per diem as they worked five. So, it is very lucrative for all seven days which you had to commit to working five days. We don't have that it is disallowed. Now my boss is in the room and I am probably going to get in trouble for saying this but one of the things I broached with them is if we had fee on the contract and some likelihood we could earn the fee would we consider as companies sharing some of that fee with craft and create our own per

diem since the government disallows it. Try to do anything we can to make it lucrative to draw them to MOX.

Senator Young: Is per diem and overtime the same?

Mr. Del Vecchio: No sir. Per diem is a daily wage you get to live and for meals.

Senator Young: Ok that is what I understood it to be.

Mr. Lee: This issue of overtime as was pointed out by Mr. Raines is a little bit of a two-edge sword because you had overtime for a long period of time and we got behind schedule. We have no overtime now and I guess we are further behind now, I am not sure but anyway we have no overtime time and yet we think that by adding overtime it will help us do schedule recovery.

Mr. Del Vecchio: A reasonable amount that is correct. I can't substantiate that the comment made we were falling behind. First of all, the three days my time on the project I think a lot of that occurred during the concrete phase, but I don't know that to be true.

Senator Young: Why would there be an overtime restriction if the budgeted amount during the fiscal year is the same? Your testimony is the contractor can do nearly double the amount of work in a given year under the same budgeted amount that is available. Why would there be an overtime restriction?

Mr. Del Vecchio: I can only speculate. I also have heard the same words that were mentioned earlier, it has been said directly to me that projects being **managed to termination**, that they work for the President, the Presidents budgeted request is to terminate, and that is what was communicated to us. There were further restrictions put on and overtime being one of them when that was voiced that we were going to manage the project to termination.

Mr. Lee: Are you allowed to spend the budget? I mean there is a \$340M or \$350M appropriation, a portion of that goes for hotel costs and other things and then there's the amount remaining for construction activities, are you able to spend all the money that is in the budget for that purpose.

Mr. Del Vecchio: No, I am allowed but I am not able to. We have underrun year over year because a lot of that would have been used, you would have spent it through overtime to be more productive. To your earlier point and question relative carryover I am not currently allowed to utilize that. I have asked and coming into FY18 that was the intention to ramp up some and spend some of that carryover not throughout the year. There is \$180M and we have also been directed to hold back \$75M in carryover. Of the \$180M \$75M is earmarked and can't be touched. But I asked if I could use the \$105M and was told no.

Mr. Little: Are there any restrictions being placed on you over and above the ones in the contract about how much you can spend on a particular item or those kinds of things. What kind of controls and interaction do you have with the contracting officer? Do you have to say mother may I?

Mr. Del Vecchio: Well yes, we do a lot of “mother may I” for procurement and we answer a lot of questions about just basic supplies. Why did you buy tape measures from here when you can get them from Harbor Freight for a couple of bucks a piece?

Mr. Little: For example, when I ran these projects I had a certain procurement authority under the contract, it was pretty large where I didn’t need the contracting officer’s approval. He would come back if I wasted money he was going to come back and say I was going to pay this amount as he should. Is it that way?

Mr. Del Vecchio: Yes, our thresholds were lowered such that anything within construction over \$500,000 and within engineering or MOX commissioning organization I think it is \$150,000. Whereas those numbers were significantly higher that was part of the change.

Senator Young: When in Aiken, I hear a lot of anecdotal information on the streets. One of the things that I have heard over the course of the last year or so from several folks is that what DOE or NNSA wanted the plant to do, the scope of that work has changed from where it was in 2008 or 2009 to say a year or two ago. Do you know what I am talking about? Is there any truth to any of that? For example, I was told that the type of plutonium that would need to go through the plant, that there was a particular type or certain variant of it, I don’t know enough about it to be able to describe it but a certain type of plutonium that was supposed to be able to go through the plant initially and that at some point, there were requests from the government to change that so the plant could process more or different additional types of plutonium than what was originally planned which added to the cost and to scope of the project. Is there any truth to that and do you know anything about that?

Mr. Lee: Is that the Pit Disassembly and Conversion Facility?

Mr. Del Vecchio: Or DMO (Direct Metal Oxidation). No because that is still the same process. Let me ask you a question this way and I am probably not the expert in this arena there are some folks in NNSA that handle the program that would be the experts on this; however, I don’t know of any changes in terms of the 34 metric tons that were deemed for this program and any change that created more of that or less of that. I have a chart; I don’t have it with me that show you all the various different types. Part of the discussion that Mr. Raines had was on some of this diluent dispose work that is going on right now. That material was never deemed for MOX. The material that is deemed for MOX has got to be weapons grade plutonium. There are other forms of plutonium that has too much of a certain isotope in it and it doesn’t fit the definition for weapons grade. I also mentioned that we would have the capability to process more down the road if that decision is made. I can’t substantiate what you are saying so I apologize but I just don’t know.

Captain Cross: How do we get the plutonium out of South Carolina? I am certainly not going to be around in 2048 to see this happen. When you finish, and the cement starts coming out one end of this thing how much do you have to produce, and customers do you have to have to start moving some of this plutonium out. I am not sure you have any customers right now. Can you only produce for the United States or worldwide?

Mr. Del Vecchio: We can only produce for the United States and while we don't have customers...

Captain Cross: It's less than 100 or 99 right now and that's not increasing so what do you need?

Mr. Del Vecchio: There is more than adequate in the 99 and even if a few more drop off the grid to be able to handle this quantity material and even if we were deemed to do more or because more was deemed to be surplus.

Captain Cross: How many plants do you need to have to manage make your through put?

Mr. Del Vecchio: I will be honest with you I am not exactly sure. There is a gentleman in the room, Dave Jones, that can answer that, but I don't know. I just know that there is more than an adequate number to get for people to sign up once we have certainty we can tell them when we have a fuel assembly for them they would be willing to sign up.

Mr. Little: This is not a huge amount of fuel; this is not putting 195 assemblies in a reactor core. This is a few assemblies in in each load because they are mixed with the normal uranium kind of fuel; this is not a full core MOX fuel.

Mr. Del Vecchio: This is not a fuel core MOX I think it is about 1/3 but there again I would rely on David because he is my nuclear reactor expert.

Captain Cross: Looking down the road that is a long way before we get started and getting this plutonium out of South Carolina and if you don't start to 2048 or 2029 it's going to be a long time.

Mr. Del Vecchio: Yes sir.

Mr. Lee: One question having to do with design, I think everyone is in agreement that the design was completed when the project started.

Mr. Del Vecchio: Yes sir.

Mr. Lee: Can you tell me about how much was done of the final design; I guess there are two categories, there is the base design and then there are specific detail designs that come out of it correct?

Mr. Del Vecchio: Correct.

Mr. Lee: So, the base design how much did you start with and when was it finished?

Mr. Del Vecchio: When you say how much did we start with when we started construction how much was done?

Mr. Lee: I mean was it 25% percent completed on the design.

Mr. Del Vecchio: The way we split those was just some old DOE vernacular between Title 2 and Title 3. Title 2 is your base design work and Title 3 is how do you make it field to fit. I believe construction started when Title 2 design was about 40% to 50% complete. There were decisions made about how much risk was involved and of course some of those were some of these we think we know enough and then we come to find out we didn't. But where that is at today in our book is 100% on the Title 2 and everything else we admitted this up front and everything else is just going to fit into the Title 3 category. We are still doing design work, but it is what you will do when you get those last glove boxes and it's slightly a different shape than what you intended how do we make fit.

Mr. Little: That x% complete Title 2 at that time wasn't something just useful it was the Department of Energy they were going through the critical decision processes.

Mr. Del Vecchio: I would like to say we walked hand-in-hand down this path. Same thing of an earlier comment that when we couldn't spend the money on construction because the design was immature we were buying and buying and buying and hence 43 acres of laydown yards with lots of materials. You know a couple of warehouses the size of five Walmart's. So that we were using the money and we would continue to get it. It was a conscious decision we were both onboard.

Mr. Lee: Were there any savings as a result of the advance purchase of all this material that you had in the laydown area?

Mr. Del Vecchio: Well certainly there were because it was earlier in the project, but we also bought in bulk whereas today we tend to buy onesies twosies because of the uncertainty about the path forward. It costs you a lot more. So instead of paying \$1,000 a valve because you bought 3,000 of them you might be paying \$3,500 a valve because you are buying 10.

Mr. Lee: Looking forward, the path forward, what are the things that you believe are going to happen to the current process that will allow you to meet the schedule that you published with regards to completion. Are there things that fundamentally have to change at the site? Can you give us some idea of those things or workforce changes or what is it you need to do to hit the schedule you said you could make?

Mr. Del Vecchio: We have to be able to control the project. I am a president of the company and I have to be able to manage the project within the budget. If that means I want to work 15% overtime for a couple of weeks to catchup on something and 10% on average and if I said I need to go buy these parts because another point that was made earlier, you can't just work the critical path. We've got so many other near critical path activities it's like whack-a-mole. As soon as I only work critical paths something else is going to pop up. So, for me regaining control of the project and if we want to have more certainty going forward you want to have shared risks we are willing to step up to the plate and sign up to do that. But it would be nice to go down this path as willing partners together versus the situation we have today. That is one of the things that has to change

Mr. Lee: Very good presentation. Thank you for your candor.

Disposition of German HEU, Gary DeLeon, Director, Government Services, Edlow International Company (Slides available here <http://admin.sc.gov/node/1543>)

Question from Council:

Mr. Little: What's the overall projected project cost for this whole effort to complete all this activity, do you have a budget in mind?

Mr. DeLeon: I will answer your question but let me qualify that because as you know we are in the very early stages of this project. In just an order of magnitude, it has been estimated to be somewhere in the upper hundreds of millions to billion to over a billion. A lot of those still needs to be better defined and I think that's part of the work that needs to be done.

Mr. Little: I understand, now how about time frame through this process you've done the evaluation, you have done the feasibility that demonstrated you can handle this kind of material and come up with some neat ways to do it this is the kind of mission we would want at Savannah River National Lab that has that capability what kind of time frame would this take from start to finish, is this months or years or what?

Mr. DeLeon: Within the German Government it is very urgent for them to be able to make a decision soon.

Dr. Monk: There is another reason we are pushing the project so strongly, we have been requested by our authorities to clean the facility as soon as possible. Not an exact time but the time frame a few years.

Mr. Little: We are not talking 30 years.

Mr. DeLeon: No. Let me try to answer your question a little bit more fully. Certainly, there is additional work that needs to be done and I think the sooner that could be resumed and the important thing is to have some confidence that this process will work.

Mr. Little: After you get what I would call the definition done and you address modifications, procedures you need, H Canyon and all of that stuff and you are into production from the start of production to the end of production that's the time frame.

Mr. DeLeon: Let's start with the transport, currently right now the urgency for Germany is the AVR fuel and a rough estimate is the transport of that would be about ten shipments by boat and it would take about a year and then if a decision to also send the THTR fuel that would take about three years for the transport. Then in terms of processing it would take about three to four years for H Canyon to dissolve this and then the department has still not decided what disposition option they have. We are very mindful of the ability of H Canyon ability. There is urgency in Germany for their own reasons, so we are looking at that kind of time frame. The Department would have to look at how this mission would fit in with their current missions.

Senator Young: Have you appeared before this council before?

Mr. DeLeon: Yes, I have.

Senator Young: Were you wearing a different hat then?

Mr. DeLeon: Yes, I briefed the council I believe in 2014 and I was with the Department of Energy at that time.

Senator Young: What did you talk to us about then?

Mr. DeLeon: I talked to you about preparing basically at the inception of this project what the Department was considering at that time they were beginning their analysis and the technology.

Senator Young: I am looking at this presentation and one of the questions I have is it says on page 13 that there is a disposition pathway for graphite fuels to help pave the way for high temperature graphite-moderated reactors being developed in the U.S. and other countries. I am particularly interested in the disposition pathway. Please tell us more about that.

Mr. DeLeon: What is being evaluated in the environmental assessment is if the decision is to receive the fuel here. In order to be able to process the fuel here first you must remove the graphite and that is the technology that is being developed and that would be the concept being considered within the H Canyon facility there would be a frame that would be installed which is a preprocessing step for the fuel and then once you do that preprocessing step and then you are left with the fuel kernels then that can be processed within the existing capabilities of the H Canyon facility. The Department has laid out

several options. The fuel would either be dissolved and sent to the waste tank and vitrified within the high-level waste or it could be down blended into the LEU disposition and that matter. The Department has not identified a range of options for dispositioning of this. And of course, there will be some low level waste that will be generated from different processes. Being able to separate the graphite you significantly reduce the potential amounts of high level waste generated from processing. It ranges from as little as 12 additional high-level waste canisters up to 100. That's a range of estimates.

Senator Young: And those would stay at Savannah River Site?

Mr. DeLeon: The high-level waste canisters would be stored along with other high-level waste that has been generated from processing other fuels that have been received at the Savannah River Site.

Senator Young: One hundred canisters? is that a lot?

Mr. Lee: That is the very high range. I think, and DOE can correct me if I am wrong, I think the total projected amount of high level waste canisters will be somewhere around 8,000 range for the entire plant production.

Mr. Little: There may be canisters that maintain other waste materials, so it would all be blended in the DWPF.

Senator Young: Who ultimately makes the decision? the Department of Energy? Who makes the decision about whether this going to take place and come to the Savannah River Site?

Mr. DeLeon: I don't want to represent the Department of Energy, but my understanding is it would be a mutual decision between the Department of Energy and the German Government. Both would have to agree on the terms for how this would be executed.

Mr. Lee: So, if I could kind of summarize what I have heard. This is a continuation of an existing agreement to process a different product, but a similar product as has been processed before as part of this closure of other reactors that you have in Germany.

Mr. DeLeon: The primary difference is I may, and this may not be completely accurate but this is my laymen's terms is the main difference with that is this all contains US origin highly enriched uranium. The main difference is that instead of aluminum clad fuel we have a graphite cladding matrix. All that was being developed is a way to remove the graphite that as opposed to be removing or separating the aluminum and the existing capability except for this preprocessing step is already there in the infrastructure.

Mr. Lee: So it's a no methodology, it's a previous agreement, it's an obligation that the US Government said that they had when they first took place back years ago when the HEU was sent over, you guys are providing all the money to do this, it will bring some work to Savannah River, and you are at the process

right now of trying to get the final approvals in the EA and get the agency and the Federal Government of Germany together to agree this is something to move forward with.

Mr. Little: There is one other thing with the work that the Department of Energy is doing right now and other designers who are designing advanced fuels of the future carbon moderated fuels like this that will put technology in place that says oh we know how to handle this fuel and it would minimize the amount of those materials going forward. It keeps Savannah River Site's skills sharp and particularly utilizes the existing talent in the lab and also keeps them working so we don't lose that talent base moving forward.

Dr. Van Brunt: I think this is something we really need to support, and I support the recommendation.

Senator Young: Is the Environmental Assessment completed?

Mr. DeLeon: It has not been issued. It is my understanding that the draft EA was basically prepared last summer, and the Department was taking into account comments that were received from the public comments and we are waiting before the environmental assessment would be issued and we are hoping that would be issued in the very near future.

Mr. Little: The draft EA was issued for public comment.

Mr. DeLeon: Yes, it was issued for public comment. It is a matter of issuing the final draft EA.

Senator Young: Do you know if there has been another public meeting since the draft EA has been released?

Mr. DeLeon: I am not aware of any other meetings since then. There has been at least two meetings, one was a scoping meeting basically announcing the Department was preparing this environmental assessment and then following that there was a public meeting when the draft EA was issued to solicit comments and in fact I think the Department also extended the comment period of that EA to give ample opportunity for comments.

Senator Young: Was there a second public meeting after the draft EA was released?

Mr. DeLeon: I think both of them were in North Augusta yes.

Mr. Lee: So frankly members as I listen to this it sounds as if most of the technical issues have been resolved and financial issues have been resolved, waiting for an EA. But for myself I have sat here earlier today and had many comments with the Department of Energy with regards to honoring an agreement. I want them to honor their agreement with regards to MOX and here I have another agreement where we are asking ourselves to honor the agreement that was made with Germany. I think philosophically as well as technically it makes good sense.

Captain Cross: I think we ought to put a caveat in there that the shipment of this fuel doesn't come until H Canyon is ready to start processing

Mr. Lee: The comment is to make certain the fuel doesn't come until H Canyon is truly ready for the fuel to arrive. So, if you would like I would entertain a motion for a recommending to the Governor as that is our obligation under the statute.

Mr. Little: I will make that recommendation.

Senator Young: What is the recommendation or what is the motion?

Mr. Lee: The recommendation would be as I understand it Mr. Little that we endorse the concept of the processing of this American origin HEU at Savannah River and ask the Department of Energy to give it due consideration.

Dr. Hudson: I would like to make sure the EA is ok.

Senator Young: We could wait for the EA.

Mr. Little: I would make it consistent with what we heard and dependent upon the successful results of the issuance of an EA and their approval so that our endorsement would be conditional upon and with the Captain's comment we want it when we are ready to take it. I think we put some provisions in there, but I haven't heard anything today that would discourage me from not proceeding forward. Now there is more work to do, there is a contract that has to be designed, the Department of Energy has to make up its mind, but do I have any objections I just think this makes sense.

Senator Young: It looks like there is somebody that wants to talk about it. I personally want to see the EA before we move forward on this.

Dr. Hudson: That is what I said.

Mr. Little: The letter says we endorse that, but the letter would say we endorse proceeding forward with the next steps. At this point I would not object what I am hearing. Obviously, our full endorsement is conditional as well, is the EA acceptable and are all the necessary things done.

Senator Young: Is there any reason why we have to do that today? I did not know we were going to be voting on this today.

Mr. Lee: I am not sure what the schedule is with regards to the EA and other activities that are ongoing outside of this room but I was under the impression that time was an issue and that completing this process in a timely matter which we may not be able to do if it was February before we had a meeting to

review it and make a recommendation. Our role is to make a recommendation to the Governor on these issues and so I don't know whether it has been done in the past.

Senator Young: We had a presentation apparently in July 2014 from the Office of Environmental Management on this, but I don't remember us making a recommendation on this to the Governor at that time. I am inclined to support it, but I also want to know all the facts before I go on record as a member of this council either for or against this.

Dr. Hudson: Could our recommendation include being contingent on.

Mr. Lee: Certainly, contingent on all the issues, shipping issues.

Captain Cross: Shipping issues, EA issues.

Mr. Little: I would word it this way; we want to proceed further with this. We want to hear more details about this but based on what we have heard thus far we don't have any objections to proceeding further to get the necessary conditions met. I think that would address the Captain's point of we don't want the stuff shipped and we find this is delayed and it is sitting out there in K area with the other stuff that hasn't left so those kinds of things.

Senator Young: I feel more comfortable with what you just said a minute ago.

Mr. Little: I will draft up a proposed letter and circulate to the committee and we can decide.

Mr. Lee: Ok, is that agreeable? I want to express our appreciation for the long trip from Germany and I was interested in the engineering, very enjoyable.

Dr. Monk: Thank you very much. We are looking forward to your recommendation and the German Government will for sure. This seems very positive.

Mr. Lee: Because of the time I can't say I have ever had a meeting that went this long. I have to tell everybody in the room that there were time sensitive issues here that it was imperative they get on the agenda. I hope the next meeting will make up for it and maybe have 60 minutes. So, I have in here a moment for me to comment on some work I have done, and I am going to forego that and save that for another time. So, we will open up now for public comments if there is anyone here that would be interested. Hey Tom, as I mentioned to you earlier if you could please focus on a five-minute timeframe and if you wish in a future meeting I am more than willing to have you make a presentation.

Public Comments:

Tom Clements, Director, Savannah River Site Watch

Mr. Clements: Yes, thank you so much. I appreciate the lateness of the hour. My name is Tom Clements and I am Director of the Savannah River Site Watch. I track a lot of the issues out at the site. Primarily issues related to plutonium management and high level nuclear waste. In my short time I want to address three points. I will keep the first one very brief. High level nuclear waste contract we just heard it was granted. I really don't know about the abilities of those companies, but I think getting the waste out of the tanks is one thing that we can all agree on and it's not as controversial as the other two issues I would like to address. I wish them all the best and I know that you and others will be monitoring the success of the new companies in doing the work and DOE will and I hope all goes well. The second issue I want to talk about is the German spent fuel and MOX. So, you may find it a little bit strange, I do DOE did not give a presentation on this today nor did the National Nuclear Security Administration. I have not seen anything that has changed the NNSA's memo which I have given to you probably a couple of times over the years that there is no nuclear arms proliferation risk by leaving this material in Germany. But NNSA did say that DOE could help the Germans in managing the material. Now I want to thank Dr. Monk, I have been to the Jülich Facility and inside I touched one of those big yellow casks. He took me around and I really want to thank you for that. I didn't recognize you when I came into the room, but it was a very nice tour. I walked around the outside of the AVR reactor and the reactor was being removed. I can understand they want to get that waste off site and I have been outside the Asse II Storage Facility where it will probably be transported temporarily if not for longer term. But you were informed two weeks ago the Citizens Advisory Board voted against bringing this stuff to the Savannah River Site and you know why is because there was an outpouring of public sentiment and I know Senator Young is concerned about this of more waste coming into the site. This has been a long process this whole EA situation. There have been two public meetings. There has not been one since the draft EA were commented on it. So, we are waiting on this final. I don't understand what the rush is with this. It is a little bit strange to me that it was Edlow that's presenting they are the ones in position to profit off the transport. DOE is not presenting to you and I don't know what that means. Bottom line is I think most people don't want waste coming into Savannah River Site, local people. Whether the EA is going to be issued I don't know. There remain concerns and as far as we heard at the CAV meeting two weeks ago the down blended HEU has contaminants in it, so you didn't hear it was going to be used as nuclear fuel which is something you should ask. I would have a long list of questions that you could ask and that are why I think Senator Young's hesitancy to jumping into some recommendation without full information. Of all the meetings we have had, and I was the one that first informed the public that this was under development what four years ago. I think some caution is called for and I agree with Senator Young about maybe you should wait until the EA comes out. On the MOX issue, I have been before you many, many, many, many times and encouraged your asking questions about what was going on. So today you have had a very vigorous discussion and I was glad to hear that finally. I mean it has been years and years and years. I encourage you to keep asking questions. I want to just mention a couple of things; Congress is feed up with what you just saw. Senate appropriators for the first time have

recommended termination with this project because it drags on and on and on with no clear end, with nothing but controversy and requests over and over again to do more study more re-baseline. What are the Senate Appropriators going to do when this comes to an agreement with the House; will it continue as a continuing resolution. I don't know. But as you may be aware of the National Defense Authorization Act has language in it subject to various things that the Secretary of Energy may waive certain requirements that construction continue one of them is related to this down blending option. It is my feeling from what I am hearing from the Hill is that is the way things are going to go. Now Professor Van Brunt I agree with some of the questions you were asking about DOE and responsibility. Listening to all of this where are the investigations into fraud, waste, abuse and mismanagement. I am only aware of one federal lawsuit by supply of poor rebar. Where are the investigations? GAO, I think is about to come out with a study of tracking some contractor compliance with regulations. I understand there may be some work going on now to try to see if the contractor can comply with the final attributes with these various work packages. Workers call me and tell me the work was done in a shoddy manner that the rework is way more than it has been said, and DOE has said at 25%. So, there's a ton of questions. We heard today there were 73% layoffs but that was the turnover rate. So, if that is the turnover rate I think it legitimately is a question why are there layoffs coming up on top of a big turnover rate. I was confused with the answers about that. Just in conclusion, I am not a fan of down blending. I think it was a huge mistake to terminate at the end of the Clinton Administration and officially in 2002 in mobilizing this plutonium and high-level waste. I do think the down blending option is quicker, it is a very simple process and it's going to be a lot cheaper. We have seen documentation to that affect and as the DOE official said it will get the material off the site. At least there is some way to get it off. I am still hesitating about it and I think the WIPP capacity is an issue. I don't see the MOX project for design problems, rework problems, massive budgeting issues, more scheduling of obsolescence issues going to fruition, I don't think it is going to happen. I think Congress sees that, I think it has been kept alive because it is a jobs program and I am sensitive to that. I would encourage you to ask a lot more questions about what is going on and we only heard the tip of the iceberg today and I will consider presenting some of my views about this because I do get input from workers including a couple times this week about what is going on at the site. I will tell you they are not necessarily unhappy about some of the workers that have left because they weren't necessarily very productive. Morale is low and they recognize turnover is high. The ones I talk to don't see the project going anywhere and it is because of mismanagement in large part. I will leave it there and thank you very much for your time.

Question from Council:

Mr. Lee: We appreciate your input and the email you sent I appreciate the information and the offer stands if you want to come back and make a presentation.

Mr. Clements: Thank you.

Mr. Lee: Ok next.

Chuck Messick, Resident, Former DOE and NNSA Employee

Mr. Lee: Can we get your name please?

Mr. Messick: Yes, my name is Chuck Messick. I am a resident of the areas as well as a former DOE NNSA, I was the former Program Manager for the Foreign Research Reactor and Spent Nuclear Fuel Acceptance Program. Was there since the inception in 1996, I was the lead and sometime the only program manager for that program. So, every bit of spent fuel that's foreign and in the basement right now I have my fingerprint on it. The reason I wanted to bring that up is I have consulted on various things as DOE over the years which includes IEA with the Russian Research Reactor Fuel Return Program with building a research Reactor in Jordan as well as with others including the Chinese MSR that we saw recently that was repatriated to China, I worked on that project as well most on the transportation side. So, I assume my comments and basis for comments are valid which I hope to view that. I want to endorse and sort of what Mr. Little had said as appropriate is I want to endorse the agreement to continue technology advancement that we are doing, the research we are doing at the site as well as waiting for the environmental documents to come back. And then look and see what a proposed resolution from that research is and from the EA that will lead you to further define what that answer is. I personally believe the H Canyon to be a treasury and there is great benefit to using that. If there is some decision that someone figures out a way to do that some other way other than using the canyon then that should be researched. I want to bring to your point four things: the HEU minimization and the MOX aspect technology development, economics and the SRS benefits. As Mr. DeLeon pointed out there is 900 kg of HEU, that represents of the foreign research reactor program, the twenty-year program, that represents about 1/5 of the HEU that we are bringing back or we hope to bring back over a twenty year period so all that will happen in that amount. The other thing I want to bring up and I hate to say this, show and tell, the atom for peace stamp that was made back in the 50s and the reason being there is a statement in here that says that all participating countries will share in the distribution of nuclear equipment, materials, training and the exchange of research information. Nuclear equipment, we are really glad that other countries chose not to build their own reprocessing facilities which is why atom for peace existed that is a great benefit we have should we share that equipment with other countries and in this case yes. A couple of other things I want to point out to you sort as your statement said specifically referring to the FRR Program is the FRR Program limited the types of material to bring back so your comment was not exactly correct in that the predecessor program to the FRR Program which was I don't know the name of in the offsite receipt program in 1988 and 92 LEU. Those programs existed because we wanted them to exist as well. Not only did we do a good thing by preventing other countries develop their own reprocessing capabilities which we are thankful other countries did not, but some did such as South Africa. We also got the material back, put it into our system and so we actually benefited by increasing the assay or the enrichment of the material and using it for nuclear weapons. That was a benefit. Then in the 90s when this new program started that had gone away we didn't make HEU anymore. Therefore, it was a burden to us; the fee that someone pointed out in an earlier presentation went from \$1,000 per kg to \$2,500 per kg. That cost didn't cover

everything. The reason the new FRR Program decided to limit what they bring back is only keep what they promised because we have the capability of dispositioning that material already i.e. dealing with clad fuel we had done it for years and we just continued to do it. The FRJ-2 Reactor that Dr. Monk pointed out the reason it shut down in 2006 is because we told them to in our contract under the FRR Program. They had to shut down by 2006 if they wanted us to take back that material and they did. So, the point of it is they supported that. There are a couple of other things that sort of give you the additional justification to the atom of peace program. There are several or at least multiple third-party documents that have been put out. One is call the National Academy of Science "Reducing the Use of Highly Enriched Uranium in Civilian Research Reactors" they put out and there is another one put out by Harvard Kennedy School, Belfer Center for Science and International Affairs, it's called "Threat Perceptions and Drivers of Change in Nuclear Security Around the World" both of those documents support as well as the nuclear security summits supports getting HEU out of wherever it is and dispositioning it once and for all. Those documents justify those things as well. Obviously, the economic benefits pointed out are very well my family lives in the area and of course that benefit is seen on both onsite and offsite. I will stop there.

Question from Council:

Mr. Lee: Thank you very much. Thank you for the presentation it was very informative. Is there one additional speaker?

Dr. Parrish Staples: Scientist, Citizen, Former DOE Official

Dr. Parrish: I appreciate your consideration and I will be as brief as possible. My name is Dr. Parrish Staples. I am a former DOE official of one of the main nonproliferation and nuclear threat programs. I was the office Director of European and Africa and Italy office of Threat Reduction. I had responsibility for the Aachen reactor conversion program as well as the American Medical Isotope Program. I retired a little bit of over a year ago to go educate the next generation in the sciences. I chose the Virgin Islands to live in. The recent hurricanes convinced me three times to participate in interesting activities like this. I appreciate your consideration. I would like to make a brief statement before the Germans - thank you for your fuel production program. I had some historical participation in it, but I am here speaking as a scientist and a citizen. I am professionally and personally supportive for the effective and I say this with emphasis to the cooperative nuclear nonproliferation research and development project which is what that project is and the stages it is currently at. In my prior professional experience, I learned of the tremendous value of maintaining and actually in fact embracing such relationships with our foreign partners where we would have close collaboration to support any of these international projects as Mr. Messick has mentioned he was involved in a lot of Chinese cooperative programs and setting them up. You understand the importance of demonstrating commitment to these programs and here we have a project with a very strong partnership between the US and German colleagues that is supporting this project. So, I would simply like to ask you to provide your support to this research and development

project so that a properly informed decision can be made how to proceed. It's that simple request to allow it to continue so informed decisions can be made in the future which are exactly the topics you were talking about before about having proper information to precede. Thank you

Question from Council:

Mr. Lee: Thank you very much. I appreciate it. Are there any other public comments? Hearing none we will close the public comment period. Closing comments Thank you all this is a long meeting and my apologies for such a long duration, but we really covered a lot of material

Senator Young: I just wanted to commend you on how you ran the meeting. You performed an exceptional job in your first meeting. As a chair with a lot of stuff, a lot of material, and a lot of questions I want to commend you on how you handled it.

Mr. Lee: Hearing nothing else we are adjourned.