

Community Advisory Council
January 10, 2008
Action Items/Notes

Final

These notes are in the following order:

1. Attendance
2. Correspondence and Handouts
3. Administrative Items
4. Global and Regional Environmental Threats to Long Island's Central Pine Barrens, Prof. Gilbert N. Hanson, Department of Geosciences, SUNY - SB
5. Agenda Setting
6. Community Comment
7. HFBR Remedial Alternatives & Preferred Alternative, Les Hill, Director, Environmental Restoration Projects

1. Attendance

Members/Alternates Present:

See Attached Sheets.

Others Present: C. Adey, P. Bond, J. Carter, G. Cava, H. Corrano, J. D'Ascoli, B. Dorsch, L. Garber, K. Geiger, D. Gibbs, G. Goode, L. Hill, M. Hime, M. Holland, S. Kumar, S. Johnson, B. Lein, M. Lynch, M. Madigan, R. McKay, L. Nelson, S. Penn, J. Petschauer, D. Quinn, A. Rapiejko, E. Rehbein, J. Sattler

2. Correspondence and Handouts

Items one through three were mailed with a cover letter dated January 4, 2008. Items four through ten were provided in the member's folders.

1. A copy of the January 10, 2008 draft agenda
2. Draft notes for November 8, 2007
3. Final notes for October 11, 2007
4. Copy of HFBR presentation
5. Copy of the Proposed Remedial Action Plan
6. Copy of the PRAP Fact Sheet
7. Copy of CERCLA criteria
8. Copy of the End States table
9. Copy of *Nano –Big Things from a Tiny World*
10. Information on possible Nano speakers

3. Administrative

The meeting began at approximately 6:38 p.m. Reed Hodgkin reviewed the ground rules and the draft agenda. Those present introduced themselves.

Doon Gibbs, Deputy Director for Science & Technology, spoke briefly about the budget for BNL. He explained that the President's budget had been good, but the House and Senate could not agree so an omnibus bill was passed. This means that the RHIC run will be reduced and there will be a decrease in the amount of funds for the NSLS and the NSLS II, as well as other cutbacks. The DOE is working out the budgets for the programs with the funds they have, the Lab will know more in one to two months. He mentioned the fact that there is a personnel matter on trial at this time in Riverhead, which he could not comment on at this time, but he advised the CAC that it may be mentioned in the news. He spoke about the State of the State Address given by Gov. Spitzer, which included a proposal for a new consortium between Stony Brook, BNL, and Cold Spring Harbor in the areas of cancer, neurobiology, plant genetics and bioinformatics.

Member Sprintzen expressed interest in hearing a presentation about the collaboration.

Reed said it would be added as an agenda item.

Member Garber asked if there is any supplemental income from the budget.

Gibbs said he could not speculate at this time, He said Congress could possibly permit DOE to rearrange its budget. Normally they specify where the funding goes, but there are possibilities for changes.

Approval of Minutes

Reed asked for corrections, additions or deletions to the November 8 draft notes. The notes were accepted as written with no objections and 8 abstentions.

4. Global and Regional Environmental Threats to L.I.'s Central Pine Barrens, Prof. Gilbert N. Hanson, Dept. of Geosciences, SUNY SB

Professor Hanson gave a presentation on acid rain, ground level ozone, and global warming and their environmental impact on Long Island's Pine Barrens. He spoke about acid rain and explained that pure rain has a pH of 5.6 due to the carbon dioxide in the air. Long Island's rain now has a pH of ~4.6. He explained how, as a result of acid rain, aluminum ions are replacing base cation particles in the soil and the impacts the increased aluminum is having on plant life. He said fossil fuels are the main culprit.

Hanson spoke about smog and ground level ozone and explained that chronic exposure is <40ppb and acute exposure is >80ppb. He showed how the higher levels are affecting plant growth. He said smog is smoke plus fog and explained that ozone production is highest when it is hot, sunny, and calm with lots of traffic, and is usually worse in areas downwind of the city. He told the CAC that according to a 2005 Report by the American Lung Association, Suffolk County had the second highest ozone level in the state and read some of the statistics from the report. Hanson said that there have been studies done on agriculture, but no studies as yet, on the affects of ozone on Long Island's native plants.

Member Esposito asked if the numbers for Suffolk County were average.

Hanson replied that the numbers were for the period covered by the report.

Member Chaudhry asked if this information is available on the web.

Hanson replied no, but said he had a copy of an article that had been published with him.

Member Giacomaro asked if ozone is heavier than air and if it comes mainly from car exhaust.

Hanson said the difference is minor, ozone is measured in parts per billion. It does come mostly from cars, trucks, and nitrogen – nitrogen oxides.

Member Talbot asked who had the highest levels of ozone.

Hanson thought it was Staten Island.

Hanson said studies predict that climate change and global warming will impact Long Island. By the year 2100, the climate on Long Island could be more like that of present Eastern South Carolina. The loblolly pine may replace our pitch pines. We will have milder winters and hotter summers with a later onset of winter and earlier spring. There will be more rain (or snow) in the winter and drought at the end of summer. Animals will not migrate, plant life will change and there will be increased air pollution. Hanson said if things continue we will have shorter winters and hotter summers and the plant life will change due to the change in temperature, ozone levels will probably increase.

Member Talbot asked what the recovery rate would be if there were a significant improvement in the amount of acid rain.

Hanson didn't know for sure, but said that recovery would be very long-term because there has been so much damage to the soil.

Member Proios commented that no matter what you do now it wouldn't have an impact for at least 25 years.

Member Hall asked for copies of the written material for his board members.

ACTION ITEM: Send copies of the presentation to Member Hall.

ACTION ITEM: Make copies of presentation and article for all members.

5. Agenda Setting

Reed said that the HFBR will be on the agenda in February and March. Items on the February agenda will include the HFBR and Nano safety. Doon Gibbs, Deputy Director, proposed two options to address the CAC's interest in Nano topics. The first was to put a different speaker, from the Lab, on the agenda for each topic for the next several meetings. They could answer questions and talk about precautions. The second proposal, which came from the CAC, was to bring in outside speakers for a workshop or panel discussion, or even one at a time. There is a list of possible speakers being handed out tonight for your consideration. Those are the proposals on the table.

Reed said that the idea is for the CAC to consider the proposals and next month we will have a discussion and decide how you would like to proceed. Then the discussions will occur and we will follow them on a month to month basis.

Member Sprintzen commented that he would love to have expert speakers in the industry come in with different perspectives on risk. I would like to have a more substantial interchange like we had on radiation several years ago.

Reed said that sounds more like a panel discussion or a workshop with different perspectives on risk showing up among the panel members.

Member Blumer asked if that would be a prelude to the concept of having a citizen component to interact with those developing nanotechnology?

Reed said the citizen component would be taking the workshop and the message out to the community as opposed just to the CAC, is that what you mean? Or are you talking about a citizen advisory panel that would come from within the CAC? That could easily be and I could see that as a discussion next month when you have the discussion of path forward and you set a specific path forward for where you want to go with this.

Member Blumer also noted that at the November meeting someone had asked Mr. Lee if the Lab was doing anything about alternative energy and he said no. She asked why the Lab isn't using nanotechnology to do more research on renewable energy.

Gibbs replied that renewable energy research is a big part of the vision for the Lab

Reed said that perhaps we could put that on the agenda as a topic of discussion.

Member Henagan stated that he would like to hear a presentation from each of the speakers listed on the handout.

Member Talbot agreed with Member Sprintzen and would also like to hear the different perspectives from key speakers.

6. Community Comment

There were no community comments

7. HFBR Remedial Alternatives & Preferred Alternative, Les Hill, Director, Environmental Restoration Projects

Les Hill said that sometimes milestones come in clusters. A major milestone for the High Flux Beam Reactor (HFBR) is that the public comment period begins today on the Proposed Remedial Action Plan (PRAP). The comment period will span three CAC meetings, beginning January 10 and ending March 17, 2008. He said back in 2006 there were two alternatives for the decommissioning of the HFBR with a decay period of 75 years, as the result of some of the things we've been working on that time frame has been reduced to 65 years. Even more significant than that is the control rods, which were the subject of a good bit of discussion back in 2006, are coming out this year. We are buying the casks and plan on having the control rod blades removed, shipped, and disposed of by the end of this fiscal year, 2008. That's a major accomplishment.

Tonight we want to bring you up-to-date since the discussions we had back in 2006. We re-analyzed the radiological inventory associated with the activated components. The results of the reanalysis enabled us to reconfigure the alternatives that we previously envisioned. We will present the alternatives as they now appear in the final Feasibility Study, the preferred alternative, and the path forward. We deliberately scheduled the comment period over three meetings. You'll have a full month to review the PRAP before the next meeting. Then, next month, we will assemble a panel of our subject matter experts to address whatever questions you have. There might even be an opportunity for open discussion among the CAC on the alternatives. What we're also looking to do is to have the County here, Chek Ng of the NYSDEC has indicated he will attend, and if Doug Poczce is available, he will be here as well.

Member Esposito asked what Hill meant by be here. Did he mean for a panel discussion, a presentation, or.....

Hill said if the CAC has questions of the Lab we'll answer them, or if you have questions of the regulators, they'll be here to address your questions. I don't expect them to field questions as...(can't understand)...but I do expect them to be here. I anticipate that there will be open discussion on the consideration of the various alternatives in March. There is a benefit to having three meetings for this.

Since 2006, several ancillary facilities around the HFBR complex have been removed. An obsolete stack monitoring facility that was no longer in use was removed, as well as a water treatment house, a pump and switch gear house, and several other ancillary facilities were removed in August and September of 2006. There is a building called the Cold Neutron Facility adjacent to the Confinement Building that housed a lot of refrigeration equipment that was used to support experiments. A couple of pieces of equipment were mildly contaminated. They were removed from the building and the building is now being used as a warehouse.

Another item of interest to you is that leak detectors have been installed throughout the low points in the Confinement Building. This was a corrective action as a result of the flood that occurred back in 2006. The five detectors are hooked up to the Central Alarm Station and are monitored 24 hours a day, seven days a week. There have been no detections of any leaks so far.

The waste loading area is being cleaned up. You may recall that back in 2005, when the 12-acre Former Hazardous Waste Facility was cleaned up, two acres were set aside to serve as a waste transfer area for bulk transfer into rail cars. Since that time, we have concluded that the best thing to do is to package the waste from the BGRR and HFBR right in the reactor buildings. Since the waste transfer area is no longer needed, we decided to clean it up now. The cleanup is being done according to the OU I Record of Decision. About 3,000 yards of contaminated soil have been removed and shipped out to Utah. That project is nearing completion and DOE is expected to come in the week of Martin Luther King's birthday to do their verification.

Member Talbot asked about shipping the soil and if there were still problems with rail shipments through Queens as there had been in the past.

Hill responded that the Lab spent a lot of time working with all the authorities ahead of time. We made sure all the questions were answered and we worked with the Office of Emergency Management to make sure everyone was briefed in advance.

As different jobs have been completed there are fewer buildings in the complex. The major buildings that remain are the Confinement Bldg., the fan house – Bldg. 704, the stack – Bldg. 705, and a series of underground pipe lines, which are also part of the project.

Over the last several months all of the work necessary to finalize the Feasibility Study and the PRAP was completed. At the center of this was the re-analysis of the HFBR radiological inventory. There has been a significant reduction in radioactive material in the complex.

Member Esposito: Caused by what?

Hill said that in reanalyzing and validating the lower numbers, some of the concerns, the issues and interests that were expressed back in 2006 have been addressed. We have discussed the resetting of the RAD inventory with the regulators; we met with them several times. We met with the County, the NYS Department of Environmental Conservation and the Health

Department, and the EPA. After all of this work, we believe we are now ready for the next step which is to move forward with the public review and comment on the PRAP.

On the reanalysis, the DOE first noticed a discrepancy in the radiological inventory in August/September 2006. The Lab was shipping some control rod blades (CRBs) that had been removed from the HFBR back in the early years. In looking at the manifest data on the CRBs being shipped, questions were raised because it didn't seem right compared to the data on the CRBs in the reactor right now. We went back and started looking at all the studies (eight to ten) done for different purposes by different people in the late 1990's. One of the things we saw was there was tremendous variability in the data. There were huge swings, nothing matched or made sense. We tried to determine why these studies were done in the first place. What we did was pull the studies apart to find out why there were differences and what the right numbers were. We didn't want to pull the CRBs out of the reactor and put them in the pool and not be able to dispose of them.

Member Esposito asked why these studies weren't looked at back in 2006 when we first discussed the CRBs. These are studies that were overlooked? What happened?

Hill said that an activation analysis was done by a firm called WMG (Waste Management Group). They had done these studies in connection with efforts by some of our predecessors to establish a preliminary baseline for the statement of scope, cost, and schedule for the HFBR project back in 2000. We viewed the analysis, it appeared complete. What we didn't do was go back and look at the other material that was available, and that's where we have found a lot of differences. So now we have gone back in with a clean sheet of paper and rationalized all of these studies and understood the differences. We have re-analyzed. The results of the re-analysis have only affected the activated components, which is the vast majority of the inventory. It affected the biological shield, the thermal shield, the reactor vessel itself, and the internal CRBs. This is the core of the facility, radiologically speaking. As a crosscheck, we went back and looked at the survey data, the actual radiation measurements that were made when the old CRBs were shipped and compared that data with the model predictions of what they thought there would be in the CRBs and we were able to validate our findings. Right now, we have a lot of confidence in the numbers I am about to report. We have had our subject matter experts, who have the capability to run these models, as well as our contractors run models and they are in very close agreement. The resulting reports have been sent to DOE, and they had an independent reviewer come in and look at the results and the methodology and right now, we have a set of data that we have a lot of confidence in.

Member Conklin said he thought that actual radiological measurements were taken inside the control rods themselves.

Hill said that there was radiation survey data that was taken from the old CRBs when they were in the fuel pool. Because the control rod blades right now are inside the reactor, there is no credible way to actually go inside the reactor to take a radiological measurement with all the sources of radiation in the reactor vessel. The detector can't distinguish what is coming from the blades and what's coming from some of the stainless steel components inside the reactor vessel. There is no credible way to take a measurement from inside the reactor vessel and assign that value to the CRBs. That was not done. We never planned to do it because it is not feasible. The data that we did have was the data that was taken when the old CRBs were taken from the reactor vessel years ago. Before they were transported to the waste management facility, they were surveyed. So we did have that information.

Member Conklin said some of the discussion was that this was a very hot situation internally.

Member Esposito agreed with Member Conklin and stated it wasn't some of the discussion; it was a lot of the discussion.

Member Conklin continued that his opinion was that we were dealing with something really hot.

Member Esposito said that we still are.

Hill said there are 13,000 rem/hour now.

Member Esposito went on to say that it is troubling to see such a wide variation of numbers.

Reed asked the CAC to let Hill complete his briefing and keep the questions to those of clarification.

Member Conklin said that his point was that he was of the opinion that the Lab had actually taken some readings internally and come up with numbers which determined some of the things that were suggested when in fact internal numbers weren't taken and these were estimates that were taken from control rods from the past and from modeling.

Reed again asked if all questions that do not pertain to clarification could be held until Hill is finished and then we will talk about how to have that dialogue.

Hill said that the activated components (reactor vessel, reactor internals, control rod blades, thermal shield, and the inner portions of the biological shield) are all located in the heart of the confinement building. These activated components constitute 98% of the inventory. As activated components the radioactive material is in a non-dispersible form. The material is an intrinsic part of the materials of construction for these components. In the case of the CRBs, the radioactive material is actually inside the metal that is part of the blade, so it's not in the form of a dust or silt or loose debris, it's actually part of the metal. (He showed unused control rod blades to CAC members, a main blade and an auxiliary blade) The CRBs and the reactor internals are surrounded by the reactor vessel (2-inch thick aluminum), the reactor vessel is surrounded by the biological shield (8-foot thick reinforced concrete and steel) and all of this is surrounded by the building, which provides weather protection and a means of controlling access to the facility and also, because it's Article 12 compliant, serves as a containment facility in the event of a leak. The bioshield is part of the deck system in the building, it's part of what holds up the building. If the bioshield is taken out, you take down the building.

Member Esposito asked Hill if he remembered the height dimensions of the bioshield.

Hill said he did not.

ACTION ITEM: Provide height dimensions of the bioshield.

We have illustrated a line by line summary of where we now stand with the activated components. The total inventory of radioactive curies has been reduced from ~416,000 to ~65,000. The CRBs saw more than a ten-fold reduction in inventory. It's down to about 22,000 curies. Even though that is a significant decrease, they're still about a third of the inventory. The CRBs still constitute a significant portion of all the radioactive material that remains in the HFBR complex.

Unknown - how many blades are you talking about?

Hill said there are a total of 16 blades. There are eight main blades where about 80 or 90 percent of the radioactive inventory is located and there are eight auxiliary blades, which contain about 10 to 15 percent of the activity.

Member Esposito asked if the auxiliary blades are different from the main blades.

Hill responded that there are different neutron absorbers ...different materials of construction.

Member Schwartz asked for clarification why the inventory is so much less now. Is it that the previous inventory was wrong, or has something been removed or has something decayed.

Hill replied that there are several reasons. One was that the technique used by WMG to model reactor operations assumed continuous operation for a specified amount of time. The plan actually operated intermittently, it would start up for a month and then shut down, start up and shut down. The exposures were right but they didn't account for the shut down time and that had a profound affect on the buildup on the blades. We'll talk about that in more detail next month.

Member Esposito asked if the work was done by a consultant and if BNL got a refund because of their incorrect assumptions.

Hill responded yes they are, but the work was done back in the 90's so, no we didn't get our money back.

Member Chaudhry asked why the number of curies increased in the reactor internals, but decreased everywhere else.

Hill explained that it was because of an assumption and we will explain in detail next month.

Reed said that one of the things we will discuss next month is more detail on why the numbers have changed. We won't push Les for an answer, but we will bring it back up next month.

ACTION ITEM: Provide detailed information on the radiological inventory analysis.

Member Giacomaro asked what the ramifications are of such a huge difference in curies.

Hill said that we will go into all that next month.

Member Henagan said that he understands that the original model assumed constant operation and did not take into account the shut down period. The remodel takes into account the shut down time, but does the remodel take into consideration highs and lows or does it still assume an average operation?

Hill responded that they made sure all the input data was as accurate as possible. We have chewed it all up. In conclusion, we have reduced the number rem/hour from 100,000 to 13,000, which is still highly radioactive. The real effect of all this is that we do not need to segment the control rod blades; we can remove them in one piece, as is. We have existing casks that will provide the shielding that is sufficient to make the move and dispose of the blades in two shipments. So the complete picture for the CRBs has changed. In the other activated components, we saw a four-fold reduction in the amount of activity which resulted in a reduction in the number of years from 75 years to 65 years. Those are the practical ramifications to the alternatives included in the Feasibility Study.

Member Giacomaro asked if those numbers are estimates from the models that you have available.

Hill responded that they are analytical numbers.

Member Giacomaro then asked what guidelines will be followed in the actual decommissioning to verify what your model has shown, and what you actually have.

Hill explained that when they get the rods down into the pool they will take accurate radiation measurements as soon as they can get a detector down into the vessel, in flooded up condition. We won't be able to tell much until we can get the CRBs into the pool and separate them from the reactor and isolate them.

Member Giacomaro commented, you are going to pull them out and you're not going to measure them?

Hill responded we are going to measure them. Right now with the CRBs being embedded within all of the other radiation sources, you can't put a detector down to measure them. As you start to raise the CRBs up and away from all the other radioactive sources, then you can get a more accurate reading on what the CRB is itself. We will actually get to that point when we make these transfers, which is a complex operation. When we actually get the CRB into the upper pit, we will be able to get an accurate reading of what the CRB dose rates are. When we get the CRBs into the fuel pool, then again, we will be able to get down there with a detector at a fixed geometry so we will be able to pinpoint what the dose rates are. Right now we looked at the analytical predictions for the old CRBs and we looked at the measured results that we actually had when we removed those blades. We looked at that, against the CRBs that we have in the vessel. Based on those comparisons, we believe we have an accurate set of data. We have done a comparative analysis of the old CRBs, the analytical results against the measured results and it is all making sense now.

Member Giacomaro asked if there are procedures in place if it doesn't.

Hill responded that the procedures will all be embedded in how we dispose of the CRBs. I don't believe there are any circumstances where we are off by an amount so significant where we can't dispose of them. It is simply a matter of will it be two shipments or three shipments, but we are not going to be segmenting CRBs.

Member Esposito said that the non-segmentation of the CRBs is the big difference.

Hill agreed that it was the biggest difference of all. When you have to cut the blades up that's where you really are getting into a lot of issues, a lot of risk issues and cross contamination that was a big driver. The number of alternatives is the same as previously reported. The titles are the same, but the difference now is the duration, the time lines. A detailed description is in the PRAP. In terms of the end states, what we have right now is the same as we talked about back in 2006. The alternatives being evaluated are Alternative A: No additional action with the end state as the HFBR is left in its current condition. Alternative B is Phased Decontamination and Dismantlement (D&D). Alternative C is Phased D&D with Near-Term Control Rod Blade Removal, and Alternative D is near-term D&D. The difference is the schedules for D&D of HFBR structures, systems, and components. Timing is real important. Timing drives the amount of decay and drives the amount of radioactive materials present when the dismantling is done, when the reactor is taken apart. The amount of radioactive material drives the radiation dose rates and that in turn drives all of the hazards and the actions that have to be taken to protect the workers. Everything is driven by radiation dose rate. The higher the dose rate, the more complicated the methods of removal and the more risk to workers. A good example is

when you get into very high dose rates, thousands of rem/hour or hundreds of rem/hour, in many cases, the work has to be done under water. In some cases, when you start getting into the larger components, because of the sizes and the sheer quantity of radioactive materials, the components have to be segmented; you have to start taking them apart. Now you are actually taking a step backwards because in the activated components, the radioactive material is actually part of the steel. When you start segmenting an object like this, you might take a hydraulic shear and try to shear it. Something that has been in the reactor vessel for a long time may be brittle, so you run the risk of fracturing it rather than sheering it. You might try sawing, but now you have loose dispersible materials, no longer all locked up. When you start segmenting large components, you really start generating a fair amount of dispersible material. In addition to the radiation dose rates, you have some significant challenges and damage control. Right now the vast majority of that building is free from contamination, and you run a pretty big risk of ending up with a big contamination issue.

Member Esposito asked the length of the rods.

Hill responded 48 inches.

He said that when you get into segmentation, some of the higher dose rates can actually extend beyond the BNL site. This is all driven by the amount of radioactive materials present and the dose rates when the reactor apart is taken apart.

Hill continued making reference to the dose rate chart which illustrated how the rem/hour decreased over time. This simplistically lumps all of the radioactive material together, it is not representative of any one component. This was put together just to illustrate what's happening over time. You can see that the inventory associated with the activated components is dominated by short-lived isotopes. These are radioactive isotopes that decay rapidly; they go from being radioactive to being non-radioactive in a short period of time. Because of the large number of short-lived isotopes you see very dramatic and rapid decline in the early years. This is similar to what we discussed back in 2006. The reanalysis of the inventory did not change the shape of this curve. That's driven by the mix of the isotopes and that didn't change all that much.

Hill reviewed the summary for the end-states and the timelines. Alternative A, remains as is, there is no change. Some of the more significant changes are the CRBs coming out this fiscal year and the 75 year duration of this decay period being reduced to 65 years. The end states of alternatives B, C and D are the same and involve the complete removal of the reactor complex. Alternative D includes the complete removal of the complex by 2026, which was previously targeted at 2012. Alternatives B & C are very similar. The only difference is the timeline for the removal of the CRBs. Both B & C will involve the complete removal of the HFBR complex after a decay period not to exceed 65 years. Alternative B has the CRBs being removed with the rest of the complex within the 65-year period. Alternative C has the CRBs being removed no later than FY2020. Recent developments have overtaken all of this, funding has been made available and the CRBs are coming out this fiscal year. In addition to the funding being made available, and the opportunity to ship a third of the inventory off site, there are some casks that are available for purchase. Their licenses expire at the end of this fiscal year. The Lab is going to purchase these casks and dispose of the CRBs in them. This greatly simplifies the handling activity on the receiving end at the disposal facility because the CRBs will be buried in the casks. They will not have to remove them to return the casks.

Member Esposito asked if that was because the casks are being bought.

Hill responded, yes we are buying the casks and burying the CRBs in them. This vastly simplifies the receipt and handling on our end as well. It is much safer and a much better

scenario for everyone, particularly on the receiving end. Detailed work planning is underway to make this happen. We are looking to buy the casks and place the order before the end of this month. The final proposal is due tomorrow. We could actually approve the procedure and start looking at and inspecting the CRB removal tools very soon. We are looking to have the casks here by the end of June, make the transfers, and make the shipments by the end of this fiscal year.

Member Esposito asked how many casks will be needed.

Hill said two casks for two shipments.

Member Henagan asked if they will be able to ship the beam plugs at the same time.

Hill answered that they are going out at the same time.

Hill said he wanted to highlight another difference between B & C. The remaining structures in the HFBR complex, the stack, the fan house, and the contaminated underground piping, when compared to the activated components, contain very small amounts of radioactive material. All three contain thirty millicuries, which is minute compared to everything else. We would be looking to complete those transfers by 2020, which was previously reported as 2009.

Member Chaudhry asked why the components in alternative B & C would be removed after the decay period. If it has already decayed, why not leave it if it's no longer radioactive.

Hill answered that they are still radioactive after the decay period.

Member Chaudhry wanted to know why then would there even be an alternative A, which leaves everything in place.

Hill replied, in the case of alternative A, these components remain radioactive for essentially an indefinite period of time. For two or three hundred years measurable dose rates would emanate from the components. After 65 years, the dose rates go down to a point where we could go in using very simple techniques without putting workers at risk and without getting into shipments. The facility can be razed or dismantled with far less risk and far less complexity. That's the reason for waiting. But if nothing is done, the dose rates still have to be monitored, because even after 65 years there would still be some radioactivity.

Member Chaudhry stated that alternative A should not even exist.

Hill replied that the Lab is obligated under CERCLA to consider the No Action alternative as a benchmark.

The alternatives have been compared against eight of the nine CERCLA criteria in the comparative analysis. The ninth criterion which is community acceptance happens at the end of the public comment period and that information will be reflected in the Responsiveness Summary. This is all identically the same as all the other decision-making cycles that we have worked through together at Brookhaven. I would like to pull out some of the highlights of the comparative analysis. When you look at alternative A, there is a significant flaw. When you look at an alternative that would result in indefinite storage of radioactive material on site, you could view that as a de-facto low level waste disposal facility. If a lawyer looked at that he might conclude that you can't even do that under New York State law. There is a significant hurdle for this alternative to even be viable. So, for all intents and purposes, alternative A is a non-starter, but we are obligated to look at it and consider it under CERCLA.

Alternatives B, C, and D all result in the removal of the HFBR complex within a period not to exceed 65 years. They are all very similar. Alternative D is distinctly different from alternatives B & C. The biggest distinction is that if you are looking to undertake the demolition of the facility, the dismantling of the reactor facility, including the activated components, the reactor vessel, the thermal shield, the biological shield in the near-term, you are going to get into segmentation and possibly flooding the reactor vessel and biological shield cavities that weren't even designed to be flooded. You will get into underwater cutting. When you look at the short-term effectiveness and implement ability, because of those issues, alternative D is greatly flawed. Alternatives B & C rate out the same. Previously when we thought we were going to have to segment the CRBs, alternative B seemed like the better option. Now, being able to load these CRBs without segmentation into the two casks, these two alternatives are basically the same. We have done the analysis and determined that they rate out the same. Now we have the opportunity to remove and dispose of a third of the inventory in the near-term at a relatively low cost without some of the risk issues that existed if the CRBs had to be segmented. Under the evaluation criteria, the cost of B and C is equivalent. Alternative C is the preferred alternative. It's rated as high under all the criteria. It includes removal of the CRBs and beam plugs which contain 35 percent of the current radioactive material inventory no later than FY08. This is a once in a lifetime opportunity to make this happen. The fan house, stack and contaminated underground ducts/piping systems will be removed no later than 2020. DOE is looking for opportunities to accelerate this work. It didn't appear that we would be able to remove the CRBs last spring, but some additional funding was found. The DOE continues to look for additional funding to accelerate the stack, fan house, and piping systems removal. The remainder of the HFBR facility will be removed after a safe storage period not to exceed 65 years.

Member Esposito asked for explanation of the 65 years. She said it was kind of vague, are we doing it 20 years from now, 30 years from now? That is a large gap of time and it's a departure from other RODs we've seen and talked about. Is that intentionally not defined better to leave it up to something else?

Hill responded that it was established as a not to exceed cap. The reason was to put an end to this so it doesn't go on indefinitely. When you get into indefinite periods of time you have issues relative to that. There are practical uncertainties, like how long can you monitor these facilities with sufficient assurance that everyone can be comfortable with. The 65 years was driven by the 100 mrem/foot standard so we have a concrete basis for it. If we see facility degradation during the course of surveillance and maintenance and it is determined necessary to accelerate and do it sooner, we will do it sooner. We will be making the annual reports to the regulators, and the Five Year CERCLA reviews. If it becomes strategically advantageous to do it sooner, for whatever reason, we will do so. As time goes on, should there be advances in technology and it becomes possible to do it safely, we may do it then. I'm looking at the robots that we are looking at using for the graphite pile removal. There are many good reasons as time goes on to review and reassess the situation. What we see in the present day is a world of difference to what I saw years ago when I was doing Shoreham back in 1992 and 1993. Should there be advances in how to approach this work, where we can do this and keep people out of harms way, we may elect to do it just to get it done if you can do it without the risks and trade-offs. That's why it is expressed that way.

Reed stated that next month we will discuss why 65 years is the number, what are the reasons to do it sooner and how would you detect that?

ACTION ITEM: Provide an explanation on why 65 years is the not to exceed number for complete removal, provide reasons why it might be completed sooner and how those reasons would be detected.

Hill said all of this gets backed up by the Surveillance and Maintenance Program. Throughout the course of the decay period, there are controls in place to control the use of the facility and to control access to the building itself. The building is subject to physical inspections and maintenance throughout the decay period. The S & M program will be subject to regulator review. The HFBR will be part of the Five-Year Review Program, there are annual certifications with the regulators, and there are annual Site Environmental Reports. The Lab will make sure the facility is maintained in a safe condition throughout this period.

At the next meeting, we will answer a lot of your questions regarding the PRAP. You have a lot to look at. The public comment period commences today, January 10, 2008 and ends March 17, 2008. We have information sessions on March 4, one in the afternoon and one in the evening, and a public meeting on March 6, here at Brookhaven. We will address comments received during the remedy selection process in the Responsiveness Summary and that will be included in the Record of Decision that will be prepared by DOE and will be sent on to the regulators. In this timeline, with us concluding the public comment period on March 17, 2008, we are looking to have a Record of Decision late this fiscal year or early next fiscal year.

Reed asked if just for this evening, members would focus their questions on clarification and information to be brought back at the next meeting as opposed to looking for details and information.

Member Esposito said she would like to request two things for the next meeting. The first would be a cost analysis for a variation of alternative C, keeping everything the same except using box five from alternative D, which says for the other activated components to be removed by the end of FY 2026 instead of after a decay period not to exceed 65 years? She would like to see what the fiscal impact of that would be; it goes from 144 million to what number. She would also like to see a cost analysis for another variation, which she called the Rolls Royce alternative, choice E, which would use the first four boxes of Alternative C and the last three boxes from alternative D. So that cleanup would be completed by 2026. I'd like to find out those costs, can we do that?

Member Proios said that he thought the decision should be made based on increased risk, not on the cost factor.

Member Esposito felt that the cost is part of the decision-making process.

Hill said we will make our best effort, but he may not have the information by next month.

ACTION ITEM: a) Provide a cost analysis for a variation of alternative C with everything the same except use box five from alternative D. b) Provide a cost analysis for "alternative E" which uses the first four boxes from alternative C and the last three boxes from alternative D.

Member Guthy asked if the first materials to be removed, the 35 per cent, were the most contaminated parts.

Hill responded that the CRBs along with some of the reactor internals are the most radioactive part, so the one third initial curie removal would be getting out most of the most contaminated parts.

Member Talbot said when he looks at the summary page he feels that most people would choose alternative B. It is less money and less exposure. I know the differences, but how did you choose C over B?

Hill said there was an ALARA (As Low As Reasonably Achievable) benefit if there is a way to do the work and save on dose or potential dose, or remove the source term, we will look at an incremental cost versus an incremental change in the source term. For a \$2 million incremental increase we can remove one third of the source now. The stainless steel components are safe right now the way they are, but since there is an opportunity now to remove this, we view this as an ALARA objective. If we were going to do this and it involved segmentation and multiple shipments, some of us might have chosen alternative B.

Member Talbot responded that if that is the criteria, then why does alternative C have a higher dose rate and higher exposure than alternative B?

Hill answered because alternative C does involve internal removal of control rod blades. There is one person/rem difference. But you are removing a third of the risk. We viewed this in terms of risk reduction and benefits. We viewed this as removing a third of the inventory with very little trade off.

Member Sweet asked why the long-term effectiveness of alternative C wouldn't be medium.

Hill responded that the differences were so minute, there did not appear to be a perceptible discernable difference.

Member Sweet said, I thought you said that regardless, the control rod blades are coming out this year.

Hill answered, we are removing them now, and this is before the year 2020.

Member Esposito asked why didn't you just say that, then.

Hill responded that when we prepared the Feasibility Study, we weren't exactly sure. We had people out looking for the funding to do the work. We are looking to accelerate the work wherever we can. If we are successful in underfunding the BGRR project for example, I would guess there might be residual funds available to take on some of these other jobs as well. We didn't want to say we would be removing them no earlier than this date because we didn't want to be hamstrung because we didn't know what would be going on at the Laboratory, what funding would be available. We wanted the flexibility to do this as soon as we could. We found out after the final Feasibility Study was published that this was possible. We told the regulators that we would make a good faith effort to get the control rod blades out as soon as we can. We were all delighted that we were able to find the funding and the casks to do it this fiscal year.

Member Sweet asked if you could also include the occupational radiation exposure estimates when you prepare the different variations of alternatives for Member Esposito and can you put it in terms that we can all understand.

Hill answered, we will do that.

Reed: Jean asked for occupational exposure estimates to go along with the alternatives Adrienne asked for and to put them in terms the CAC can understand.

ACTION ITEM: Prepare occupational exposure estimates for the variations of the alternatives requested.

Member Garber said now that you have estimates as to how radioactive the components are, is it feasible to drop a monitor into the system and calculate, given the current estimates of the inventory, what the radiation levels would be. So it would be an actual measurement of that

whole panorama. Is that possible and if so, it might be a confidence builder that you really do have a handle on what the radioactive inventory is.

ACTION ITEM: Provide response to the question can you drop a monitor in to the system to get an accurate measurement of radiation given the current estimates?

Member Henagan asked if a second decay rate chart could be overlaid onto the one you have prepared so we can see the differences in the dose rate with the control rods removed. And, can you estimate how accurate the model is? It's going to be a lower term, once you take 16K out of that obviously the curve drops - the whole structure without the rods.

And also since you may not be able to measure the radioactivity in the core by the next meeting, could you estimate of how accurate the model is.

Hill said we can do that.

ACTION ITEM: a) Prepare overlay chart to show the differences in the dose rate with the control rod blades removed. b) Estimate the accuracy of the model.

Member Chaudhry asked if the cost projections are in terms of today's dollars.

Hill answered yes.

Member Chaudhry continued because it is hard to see why alternative D is so much more than alternative C where C and B are so close. Is it due to the fact that you are facing high radiation to work with?

Hill explained that the reason the cost for B and C is relative to D is the annual expenses associated with surveillance and maintenance costs. We do include surveillance and maintenance costs, we don't escalate anything. When we do these analyses we refrain from doing that because you could come up with a bazillion different opinions about what escalation means. The only differences between B and C are the near-term costs associated with removing control rod blades. They're identically the same.

Member Esposito commented that in reality we don't know what the cost is going to be in 50 years.

Reed said that there is a lot of information to bring back for discussion next month. The discussion next month will also involve a panel of the site experts ready to answer your questions – bring these answers and answer any other questions you may have. And a discussion, which right now it's envisioned to be a panel discussion, yet to be worked out with the regulators, but you'll have a chance to talk to the regulators themselves and ask them what they think of the alternatives and how they come down, what their positions are. That's for next month along with your discussion on how to go forward with the Nano discussion process for the group.

The meeting adjourned at approximately 9:19 p.m.

Agenda Topics	Votes
Global Warming, Stony Brook, Pine Barrens (1-10-08)	15
CAC as a conduit/resource to the community	13
Emergency Operations Center tour and drill	12
Nano technology	11
CERN – problems and implications	11
Site Environment Report – good and bad (11-8-07)	11
Nano safety	10
Regulator presentations on areas they oversee	10
Energy	9
Overview of programs	9
Deer Management	8
Anti-terrorism update	7
NSLS-II briefing	7
Nuclear power plant safety	6
Education Programs	6
Energy efficiencies	6
Sustainable transportation	4
Natural Resources management	4
Nano ES & H (October 11, 2007)	3
Safety and Security	3
Experimental Review Process	3
Latest RHIC findings	2
How the Lab supports nuclear facilities in the N/E region	2
Status of P-2 road show	2
Heating plant and efficiency research	2
Lyme Disease	2
CAC process	2
Alternative fuels	2
Update on phyto/bacterial contamination remediation research	1
Deforestation	0
Work planning process	0

New Topics Added After September 2007 Vote

Global warming – BNL research
 Nano toxicology
 Nano ES&H issues at BNL and beyond
 Nanotechnology/science at BNL
 Nano management policy issues
 Nano panel discussion with the DOE, EPA, and FDA
 Renewable energy research at the Lab
 BNL/CSHarbor/Stony Brook collaboration

2008	Affiliation		First Name	Last Name	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
	ABCO (Garber added on 4/10/02)	Member	Don	Garber	P											
	ABCO	Alternate														
	Brookhaven Retired Employees Association	Member	Graham	Campbell	P											
	Brookhaven Retired Employees Association (L. Jacobson new alternate as of 4/99)(A. Peskin 5/04)	Alternate	Arnie	Peskin												
	CHec (Community Health & Environment Coalition (added 10/04)	Member	Sarah	Anker												
			Ann Marie	Reed												
	Citizens Campaign for the Environment	Member	Adrienne	Esposito	P											
	Citizens Campaign for the Environment (Ottney added 4/02-takenoff 1/05 Mahoney put on)(7/06 add Kasey Jacobs)	Alternate	Kasey	Jacobs												
	E. Yaphank Civic Association	Member	Michael	Giacomaro	P											
	E. Yaphank Civic Association (J. Minasi new alternate as of 3/99) (M. Triber 11/05) (Munson 6/06)	Alternate	Brian	Munson												
	Educator (changed 7/2006)	Member	Adam	Martin												
	Educator (B. Martin - 9/01)	Alternate	Bruce	Martin												
	Educator (A. Martin new alternate 2/00) (Adam to college 8/01)(add. alternate 9/02) (changed 7/2006)	Alternate	Audrey	Capozzi												
	Environmental Economic Roundtable (Berger resigned, Proios became member 1/01)	Member	George	Proios	P											
	Environmental Economic Roundtable (3/99, L. Snead changed to be alternate for EDF)	Alternate	None	None												
	Fire Rescue and Emergency Services	Member	Joe	Williams												
	Fire Rescue and Emergency Services	Alternate	Don	Lynch	P											
	Fire Rescue and Emergency Services	Alternate	James	McLoughlin												
	Friends of Brookhaven (E.Kaplan changed to become member 7/1/01)	Member	Ed	Kaplan												
	Friends of Brookhaven (E.Kaplan changed to become member 7/1/01)(Schwartz added 11/18/02)	Alternate	Steve	Schwartz	P											
	Health Care	Member	Jane	Corrarino												
	Health Care	Alternate														
	Huntington Breast Cancer Coalition	Member	Mary Joan	Shea												
	Huntington Breast Cancer Coalition	Alternate	Scott	Carlin												
	Intl. Brotherhood of Electrical Workers/Local 2230 (S.Krsnak replaced M. Walker 1/11/07)	Member	Scott	Krsnak	P											
	IBEW/Local 2230	Alternate	Philip	Pizzo												

2008	Affiliation		First Name	Last Name	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
	L.I. Pine Barrens Society	Member	Richard	Amper												
	L.I. Pine Barrens Society (added P. Loris 6/05)	Alternate	Elina	Alayeva	P											
	L.I. Pine Barrens Society	Alternate	Susie	Husted												
	L.I. Progressive Coalition	Member	David	Sprintzen	P											
	L.I. Progressive Coalition	Alternate	None	None												
	Lake Panamoka Civic Association (Biss as of 4/02)	Member	Rita	Biss	P											
	Lake Panamoka Civic Association (Rita Biss new alternate as of 3/99)	Alternate	Joe	Gibbons												
	Long Island Association (Groneman replace 10/05)	Member														
	Long Island Association	Alternate	William	Evanzia												
	Longwood Alliance	Member	Tom	Talbot	P											
	Longwood Alliance	Alternate	Kevin	Crowley												
	Longwood Central School Dist. (switched 11/02)	Member	Barbara	Henigan	P											
	Longwood Central School Dist.	Alternate	Allan	Gerstenlauer												
	NEAR	Member	Jean	Mannhaupt												
	NEAR (prospect taken off ¾)(Blumer added 10/04	Alternate	Karen	Blumer	P											
	NSLS User	Member	Jean	Jordan-Sweet	P											
	NSLS User	Alternate	Peter	Stephens												
	Peconic River Sportsmen's Club (added 4/8/04)	Member	John	Hall	P											
	Peconic River Sportsmen's Club	Alternate	Jeff	Schneider												
	Ridge Civic Association	Member	Pat	Henagan	P											
	Science & Technology (added 1/13/05)	Member	Iqbal	Chaudhry	P											
	Town of Brookhaven (Graves made member 6/06)	Member	Anthony	Graves	P											
	Town of Brookhaven	Alternate	None	None												
	Town of Brookhaven, Senior Citizens	Member	James	Heil	P											
	Town of Brookhaven, Senior Citizens (open slot as of 4/99)	Alternate	None	None												
	Town of Riverhead	Member	Robert	Conklin	P											
	Town of Riverhead (K. Skinner alternate as of 4/99)	Alternate	Kim	Skinner												
	Wading River Civic Association	Member	Helga	Guthy	P											
	Wading River Civic Association	Alternate	Sid	Bail												