

The PNWIS 2005 UNIVERSITY STUDENT ENVIRONMENTAL CHALLENGE PROBLEM

International Perspectives on Environmental Management

The Purpose

The Environmental Challenge gives teams the opportunity to develop solutions to a mock environmental problem and have the experience of presenting their solution to a panel of environmental professionals. We do not give you a lot of numbers to crunch. We are more interested to hear about the issues involved, how you interpreted the problem, how you got to your conclusions, and how well you can communicate your thoughts. We want you to have fun! This exercise gives us all a chance to participate and gets the professionals of tomorrow to interact with the professionals of today.

The Problem

In this problem your team represents a group of consultants who have been asked by a Canadian/American joint venture, CANCAN, to buy a pre-1974 2800 MW high sulphur-burning coal fired power plant (the Hguanhi Power Plant (HPP)) which is located in eastern-most China. The joint venture realizes that the fastest growing economy in the world is China and there is the potential for huge profits. The joint venture has asked you to help them identify “issues” by reviewing a summary report (Appendix A) that was prepared earlier this year, interviewing on November 9th and 10th some of the authors of that report, and applying your extensive knowledge of environmental issues associated with power plants.

While in real life your team might be all engineers, in this Problem you might morph into whatever and whomever you think that you need to “win” the competition.

Your Assignment

CANCAN needs to understand the environmental risks associated with purchasing HPP. Your assignment is to identify potential impacts associated with the plant on people and media (land, water, and air) from a local, regional and world perspective. Appendix A below provides an overview of some environmental and non-environmental issues at the plant. Are there any implications of the non-environmental issues to the environmental challenges the plant faces? While CANCAN is not looking for detailed cost estimates they would like to understand which issues are likely to fall in any of the ranges below:

- <\$1,000,000 USD
- \$1,000,000 to \$20,000,000 USD
- >\$20,000,000 USD

The Expectations

Numbers are not what is most important – logic train, process, conceptualizations, and creativity are keys. And then you have to present your thoughts in a public forum. Clarity of vision and logic of presentation are critical. Remember you can come up with assumptions, but they need to be able to pass the straight face test. This is like the real world!

We have expectations with regard to the Proposal (see below) and the Presentation (see below). The **Proposal** expectations include identifying team member by name and the role that they are going to have in the presentation (ie “Busta Rymes” is going to be engineer and will address waste issues, “Fat Man Scoop” is going to be your air expert, “Mariah Carey” is going to be our ‘architect’, and “Kelly Clarkson” is going to be your shaman etc, - you put in the disciplines that you think you need). In the proposal you should have an outline of the approach that you are going to take and the issues that you will be discussing. **Remember you will only have a maximum time of 15 minutes to present your plan and you have a two page limit for the proposal submittal.**

For the **Presentation**, your team will need to demonstrate your understanding of the issues that you addressed in your proposal. Sustainable approaches for these and other site issues are of great interest to the owners. Winning will hinge on approach, clarity, and creativity.

The Proposal

Each team will develop a proposal for problem solution to be submitted on the first day of the conference, November 9. The proposal should include key elements such as areas of expertise, issues to be addressed, and the general approach to the project. The proposal should be in summary form and limited to two pages. The proposal will be a factor in the competition.

The Presentation

Teams should arrive at the conference on the 9th of November. Presentation of the team solutions to the problem will be held on Friday morning the 11th of November. When we know how many schools will be presenting we will develop a schedule, but figure on the presentations beginning at 8:30 AM. PNWIS will have a projector and a laptop. Please bring a data stick or disk burner so we transfer your presentation to the laptop. Plan on a 15 minute presentation with 5 minutes of questions and answers.

The Tweak

No matter how much you do and know, in real life things that are unexpected can and do occur. To this end you should expect when you pick up your registration package that there might be some late breaking information that might alter your approach and/or require your plan to evolve. The problem and the tweak will require that you find and talk to “experts” and attend the sessions for answers and important information.

Appendix A

EXECUTIVE SUMMARY: HGUANHI POWER PLANT COAL BURNING PLANT

In April 2005, a major consulting company visited the Hguanhi Power Plant (HPP). The purpose of the visit was to assess general material compliance of the facility, review existing environmental issues, review the collection and maintenance of continuous emission monitoring data, and identify potential major liabilities associated with environmental conditions at the facility.

The HPP facility is a 2800 MegaWatt (MW) coal-fired thermal generating station. The facility has eight generating units (1-8) constructed from 1956 through 1972. Units 1 through 4 are dry-walled bottom fired units. Units 5 through 8 are cell-burning units.

AIR QUALITY

The HPP facility was the first coal-fired electric generating station constructed in Liaoning China in the heart of one of China's major industrial areas. The plant does not have scrubbers for particulates, NOX, or SOX.

The facility monitors opacity and emissions from its units and submits quarterly reports to the Chinese equivalent of our EPA or the Ministry of the Environment. The submittals indicate that there are significant exceedances in emissions and opacity. The facility has reported excess emissions and opacity often.

WATER QUALITY

The HPP discharges its wastewater and storm-water discharges into a near by river. The HPP facility is required to submit monthly discharge monitoring reports to the regulatory agency. The facility has reported several instances of non-compliance with the discharge limits; no notices of violation have been issued.

The HPP facility is required to maintain the Chinese equivalent of a Spill Prevention, Control, and Countermeasures (SPCC) plan. The SPCC plan was deficient in several areas.

LAND ISSUES

The HPP facility operates one landfill onsite that is permitted to receive fly ash, bottom ash from the boilers, as well as facility trash, petroleum-contaminated soils, and asbestos-containing materials. The landfill cell has spread to 30 acres since its conception. Homes rim the landfill with more than 400,000 people living within 1 mile of the landfill. There was no evidence of daily cover. There was no evidence of a liner or monitoring wells at the facility.

The existing landfill has approximately 3 to 5 years of capacity (vertical only can not expand horizontally) An additional area for landfilled material is available on the other

side of the plant; the cost of construction of the new landfill according to the plant would be approximately \$100,000 USD.

HAZARDOUS WASTE

The facility generates hazardous waste. Petroleum-wastes are disposed of in the boilers. No hazardous waste manifest or their equivalent were evident. It was not clear what occurs to the waste.

ASBESTOS

The facility has a substantial amount of potentially asbestos-containing material (PACM). While an asbestos management program was reviewed, few labels were evident on any PACMs, asbestos removal appears to be conducted without worker protection, and the asbestos-containing materials appear to be routinely disposed of in the landfill without the landfill staff knowledge.

ENVIRONMENTAL MANAGEMENT SYSTEMS

The environmental management system (EMS) at the HPP facility is in the early stages of development. A facility electrical engineer is responsible for EMS development and implementation. The electrical engineer is in the process of developing a facility environmental statement and objectives based on the corporate policy, as well as identifying significant environmental aspects of the operations onsite. In addition, the facility does not have a formal documented audit program for management systems or regulatory compliance; however, this is being developed in conjunction with the EMS development.

OTHER ISSUES NOT ADDRESSED IN THE APRIL 2005 REPORT

Possible non-environmental issues or concerns to be addressed at HPP.

- Deferred maintenance,
- Facility security,
- Filing system,
- MSDS (or equivalent) concern (they have some of them but they are not up to date, not located near the chemicals, and there appears to be only one copy in the plant managers office),
- Relationship with the agency,
- Response training,
- Poor housekeeping goes beyond environmental concerns, and
- The fuel source screening and contracts (quality control).