APEGM Progress Report for: #9999 - Lane Doe Student

Period beginning: **Apr 26, 2010** and ending: **Aug 31, 2010**. **(4 months)**

Submission Date:	Aug 30, 2010
Supervisor:	Bob Barker P.Eng., Submitted on Aug 30, 2010
Period Employer:	Manitoba Hydro
Job Title:	Student (Technical Support)

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1. Give a description of the Engineering work experience you have obtained during this reporting period. Include information supporting the rest of your answers.

1. Company Profile

Manitoba Hydro is a Crown Corporation, is the province's electric utility, and is the leading employer of engineers in Manitoba. They serve 532,000 electric customers throughout Manitoba. Hydro is also the largest natural gas distributer in the province providing natural gas to 274,000 customers. Most of the electricity provided comes from renewable hydroelectric dams; there are currently 14 dams mostly on the Winnipeg, Saskatchewan and Nelson rivers. Manitoba Hydro recently constructed a new environmentally friendly head office building in the downtown area and it provides a comfortable workspace for employees.

2. Overview of Work Experience

The summer work term I worked in the New Generation Construction Division where I worked with the Keeyask Engineering and Construction Department. For the majority of the summer I was given the task of developing a memorandum complete with flow charts for the material utilization plan for the Keeyask Project. The memorandum was included with the flow charts to provide explanation, quantity summary, schedule and background information. The flow charts were presented to Manitoba Hydro Staff and the design consultant. Feedback from both stakeholders was incorporated into the final memorandum. The material utilization plan for the Generating Station is very complex and involves up to 14 borrow deposits, 7 major permanent structures (2 concrete structures and 5 earthen structures), approximately 12 major temporary structures, and a possible 30 excavated material placement areas. For the Keeyask project, 3,356,000 cubic metres of unclassified material will have to be excavated and placed. Another 1,990,000 cubic metres of rock will have to be excavated for the structures as well as 362,300 cubic metres of concrete will be used. I also worked on a number of other tasks throughout the summer.

3. Application of Theory

• Utilizing the material flow charts, I developed a hauling schedule truck analysis for some of the major structures, I determined the cycle times, the fleet size and type of haul vehicles for the Keeyask Generating Station
• I developed a Gantt chart comparing two schedules and workforce estimates that allowed me to interpret the differences for some of the contracts for Keeyask

4. Practical Experience

• Prepared and gave an oral presentation on the memorandum and related material flow charts that I developed to Manitoba Hydro Staff and the design consultants. Utilizing the feedback that was given I

was able to finalize my memorandum.
• Studied hydroelectric dams built by Manitoba Hydro, how to build a generating station, studied cross-sections of cofferdams and dykes to understand geotechnical issues and construction sequence. I read about Manitoba Hydro's current Wuskwatim Project, reading construction reports about the project.
• Studied site drawings and reviewed Environmental Impact Statement for the project and see the possible effects of a hydroelectric dam on the environment, and ways to mitigate the effects
• Toured Selkirk Generating Station a natural gas generating Station and learned how a steam turbine works. I also learned about the controls and maintaining the system. I was exposed to other departments related to engineering in Manitoba Hydro.
• Exposed to many meetings and presentations about cost estimates for the Keeyask Generating Station
• Exposed to export power purchase agreements, to gain an understanding of the domestic load, export sales and the requirements for new generating stations
• Based on discussions with construction staff, evaluation of site conditions, and industry standards I was able to determine truck size and types for the haul schedule analysis

5. Engineering and Project Management

• Developed Material Flow Charts for the material utilization plan for the Keeyask Generating Station, and wrote a memorandum to provide explanation and background information for the flow charts. The flow charts included things such as a construction schedule, material quantities, average quantities needed and percentage of source used.
• Gained a working knowledge of the scheduling software Primavera and was able to create schedules, became familiar with the terminology such as the critical path, predecessor, successor and how they are linked
• Development of design cost and time budgeting worksheet of the different consultants for the Keeyask Project

6. Ethical Responsibilities

I was required to make decisions based on an engineer's professional and ethical responsibilities as follows, to:
• The environment
• The employer
• Co-workers

7. Conclusion

I learned a lot about what is required in order to build a hydroelectric dam. I also learned about construction management. My experience in a professional environment will be very useful when I pursue a career in civil engineering. I found the work term to be very helpful and it will aid in my studies for the next term. Technical Communications was a good course for my summer employment because it provided some preparation in giving oral presentations and some background in writing technical documents. Engineering economics would have been a useful course for my work term. Geology for Engineers was helpful in my understanding of the geotechnical portion of my memorandum. Fluid mechanics provided me background information on how a hydroelectric dam would work and hydraulics would further aid in my understanding designing and building a dam.

Supervisor Agrees.

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2. Please check the following options that apply:

2.1: During this reporting period, I have applied theory in:

- ✓ Analysis/Interpretation
- Project Design/Synthesis
- Testing/Verification
- Implementation

Supervisor Agrees.

2.2: I have obtained experience by:

- ✓ Studying or being exposed to existing Engineering works
- ✓ Applying Designs as part of larger systems
- Experiencing the limitations of Engineering designs
- Experiencing time as a factor in the Engineering process

Supervisor Agrees.

2.3: I was exposed to the following areas of Engineering management:

- Planning
- ✓ Scheduling
- ✓ Budgeting
- Supervision
- ✓ Project Management
- Risk Assessment

Supervisor Agrees.

2.4: I was required to make decisions based on professional and ethical responsibilities to:

- The Public
- The Profession
- ✓ The Client and/or Employer
- ✓ Co-Workers
- ✓ The Environment

Supervisor Agrees.

3. Describe any activities that have improved your Communication, Teamwork, or Interpersonal Skills in the following areas:

Oral Presentations:

Written Documents:

Interaction with Others:

Other:

Supervisor Agrees: See number 1 above for an example of oral presentation and writing skills

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4. During this period, I had to consider the social implications of my work in the following areas:

Supervisor Agrees.

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5. Examples of my ability to work effectively as part of a team, during this period, include:

Supervisor Agrees: See number 1 above for an example of team work

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6. Examples of my ability to assume responsibility include:

Supervisor Agrees: See number 1 above for an example

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7. I have shown progress since the last report (where applicable) as follows:

Supervisor Agrees: first work term

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8. I feel myself to be lacking in exposure to, or requiring improvement in, the following areas:

Supervisor Agrees.

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9. I would like to provide the following additional, relevant information:

Supervisor: Bob Barker P.Eng. (First Registered: Nov 22, 2001)

I make the following evaluation and recommendation regarding the progress report for this MIT:

Lane was an excellent addition to the Keeyask Engineering & Construction team this last summer. The work she completed on the material utilization memo/flowcharts showed her ability to take on a complex issue and break it down to managable tasks while still keeping the big picture in focus. Great job.

With more exposure to the Engineering field Lane will gain the experience and confidence she requires to continue to perform at a high level as indicated by her work this last term.

Future work in Technical specialities such as Hydraulics and Engineering Economics will assist her into becoming a well rounded Engineer.

In my opinion, during this reporting period, (Apr 26, 2010 - Aug 31, 2010) (4 months), Lane has completed an equivalent of *3* months full time experience.

Please show my comments to the MIT.
