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New Technology

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Moral Issues in Engineering
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As a recent civil engineering graduate, you have had hands on experience with the latest in surveying equipment. You have been hired on at a firm because of the research you have done with the computerization of land surveying equipment. This new form of technology is able to scan and plot the shape of land down to the square inch, a vast improvement over older equipment. The results of this equipment will generate results at a higher accuracy than the old method currently in use.

Although your research in the equipment has made you stand out in college, the company in which you now work for has not taken the steps to purchase or develop the technology on their own. The equipment you were working on will be on the market in only a few weeks, after some bugs are worked out of the demonstration model. You know that such equipment would save the company time and money. You also feel that the public image of the company will improve by showing the company's willingness to take steps forward in the progression of more efficient, more accurate, and more cost effective technology.

You have discussed the option with your manager in purchasing the equipment you were developing at your university. Your manager feels that the old equipment works fine and that there is no need to upgrade the equipment. You argue that the new equipment is not only faster at accomplishing the job, but is more reliable as well. He still feels that the old equipment is sufficient and that you should drop the idea.

You fear that stepping over you manager will only cause a loss of respect. You are new to the company and you want to be a team player. The company would have to spend a lot of money to replace all of the old equipment in order to make the transition you want. What should you do? What are the possible consequences of your actions?

The following questions were attempted to be brought out in casual conversation about the case study on the previous page. Having an unstructured interview and letting the conversation flow from one point to another is, I feel, the easiest way to draw out the answers I am looking for. This will also allow my interviewee to feel comfortable about discussing company policy and actual events that have occurred in the companies past.

What is the educational background of the interviewee?

What is the background of the company (how big, how long has it been established)?

Is the case study mentioned realistic?

Could a situation as described above occur at this company?

If not, what steps have been taken to assure this situation will not develop?

If so, what changes would you recommend stopping the situation from occurring?

Is there a research and development division of the company?

Should there be? Is it necessary for there to be such a division?

What type of relationship is there within the company (professional/family atmosphere)?

Is everyone in the company on a first name basis?

Do you feel comfortable calling your supervisor by his or her first name?

Is it easy to approach upper management with a problem?

Do you look to co-workers before consulting your manager?

What would you recommend the engineer in this case to do?

How far up should the engineer reach, if it is the right thing to do?

Is it okay to stop with his manager? What about the next level up?

Should the company president be consulted in a case like this?

Do you feel it is in the engineer's best interest to talk to upper management?

Interviewee Background:

For this case study, I interviewed Don Luce, a Corporate Controller for Great Lakes Dredge & Dock (GLDD). Don has an Associates Degree in Science and has been working with GLDD going on twenty years now. He was originally hired as a quantity take-off and draftsman for a summer stint after his sophomore of college. Between May and September of 1984, Don worked as a surveyor on a jobsite in San Francisco, California. When he completed his degree, Don was hired on as a project estimator where he worked for nine years. He then changed hats and became the Corporate Controller for GLDD where he currently resides after ten years in the financial area. I felt Don Luce has sufficient knowledge both in the field and in the office and would thus be a good candidate to evaluate the New Technology case study.

Company Background:

Great Lakes was founded back in 1890 and has since had a strong and proven history in dredging, beach nourishment, and land restoration. The company changed its name to Great Lakes Dredge & Dock Company in 1905 and had an array of thirteen dredges and ten tugboats. GLDD has had a hand in numerous projects including but not limited to: the foundations of Navy Pier, a water tunnel that extends beneath Lake Michigan, a fourteen mile landfill project (providing space for Soldier Field, Field Museum, Meigs Field, etc.), as well as port deepening, and land restoration (East coast hurricane cleanup). The company now owns thirty multi-million dollar dredges. The federal government is responsible for about seventy percent of the company's revenue with the other thirty percent coming from local governments. The main focus of

GLDD's resources (\$65-100 million per year) is centered on beach re-nourishment and rebuilding coastline after hurricanes.

Equipment:

Great Lakes Dredge & Dock maintains three different types of dredges: Cutter Suction, Hopper, and Bucket. Each dredge is uniquely designed for specific types of jobs from blasting and excavating sand and rock to harbor work, pipeline crossings, and trench and tunnel excavation. Depending on the size of the dredge and materials being removed, they are able to excavate between fifteen and forty thousand cubic yards per day or about twenty-six cubic yards per minute. The operation cost of these machines run between thirty-three and one hundred thousand dollars per day. Global positioning satellites keep constant track of all equipment in the field from the dredges to auxiliary and support equipment.

Company Culture:

The old bureaucratic style of business has been thrown to the way-side with the changing managerial positions at GLDD. The company maintains a low turnover rate with a majority of the big shots originating from the field. For entry level field work, there is a one month training session for surveying and quality control that one must go through before beginning work. GLDD tends to promote from within keeping a somewhat steady and successful company atmosphere alive. The vast majority of upper management personnel (in all types of work) have their company roots in the field. The four hundred million dollar company is a leader in technology in the United States, but

surprisingly not the world. The federal Jones Act of the 1920s limits the involvement of foreign vessels working on United States docks (necessary from a military standpoint) and therefore GLDD is not pressured to compete globally for U.S. projects. However, a sixty-five million dollar Hopper Dredge was just constructed using technological advances seen world-wide. GLDD, while mainly working in the United States, has and does have contracts world-wide (most recently in the Middle East which is continually building their docks outward). Although there is no Research and Development division in GLDD, their electronic and mechanical engineering divisions are responsible for the fifty million dollars spent on maintaining and improving their equipment.

Case Examination:

Don's first impression with the engineer in this case is that he or she was cocky and arrogant. He felt that this person did not know enough about the company to know how to propose such a capital improvement. Going behind anyone's back was seen as a bad political move, but ethically feasible if the situation was presented in good spirits. Side-stepping management is view as being too aggressive, getting permission to work out the detail of a project or doing so on your own time is recommended as an alternative. Don Luce recommended that the engineer do more than just argue, but obtain quantitative research to propose within the channels of the company. It would be wise of the engineer to ask around to determine how capital improvements are made. This engineer should get better acquainted with the inner workings of the company and fully understand how the company works before taking any drastic measure. If a decision is made in opposition, the engineer should strongly consider if he or she wants to continue working

in the company. If so, Don would suggest backing off a bit and seeing how future proposals work out. In any case, one should rationalize the move he or she is going to take. Understand the company culture and channels in which one can work. If a situation develops when one does go above, be respectful of others and inform the party of such ventures. Above all, document benefits and note figures while keeping the situation in good spirits.

Conclusion:

The time spent developing and conducting this project was successful on various fronts. The interview showed me that the corporate culture in a large corporation, such as GLDD, can be structured as a small business. The variety of top level jobs inside such a corporation all stem from a mutual background. This is important for the survival of a company because of the wide view one has when adapting new responsibilities. Tunnel-vision is thusly negated with the knowledge and understanding of what the “lower level” personnel deal with on a day-to-day basis. The interview verified for me that such problems as the introduction of new technology do arise in the workplace. Such problems do exist and are confronted by corporations on a regular basis. One needs to fully understand the corporate culture of the company they work for before beginning on a venture that they wish to see succeed. It is pleasing to note that respect does play a big role in large corporations and that having respect for those around you does not only help keep your position, but it may also improve your rankings in a company. No matter how right you are, you need to understand the rules and play ball in order to survive.