

Engineering Ethics in Spain: The Risky Tank

(Case 1041)

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Editor's Note: When doing business internationally, it is important to recognize both the universal ethical obligations of the engineer and the specific laws and regulations that govern engineering practice. The geographic context for this case study – a rural community in Spain – reveals certain distinctions between engineering practice in Spain versus the United States. Some of these distinctions are discussed at the end of the case.

The Case:

Carlos has recently finished his engineering degree and has been hired by a firm, Tencasa, that currently focuses on structural design projects but wants to expand its range of services to include hydraulics projects. Carlos has a six-month contract and, after that, the company will decide whether they keep him as an employee of the firm.

It is Carlos' first job and he will be in charge of Tencasa's new hydraulics division. After a month, Carlos has not yet been in the field, but this situation changes. Carlos' boss tells him that they have found a project, but it has to be completed in less than a month. The project consists of building a storage tank and several pipelines that connect with the water supply system for the town of Liria, near Valencia (Spain).

The project seems straightforward, but Carlos spends all weekend studying and reviewing the entire project and its calculations. Under direction from his boss, on Monday morning Carlos picks up three Ecuadorian workers and goes to the town to begin work on the project.

During the first week the work is clear-cut, and the project progresses quickly.

Carlos spends a lot of time with the workers — having lunch, working side by side with them, or simply talking. In time he realizes that the three workers are illegal immigrants. One used to be a schoolteacher and the other two were musicians. He also learns that the workers do not have any type of worker's compensation or other medical insurance. They tell him that they earn three or four times the wages they earned in Ecuador and their families depend on this money. Further, they realize they do not have any medical insurance and that construction work carries some risk to their health.

Carlos sympathizes with the workers and becomes increasingly concerned about safety on the construction site as well as the potential liability associated with a government investigation related to hiring illegal immigrants. However, Carlos balances this concern with the realization that the men need to earn money and support their families. Besides, the workers are doing a good job.

During the final week of the project, the main task is the completion of the storage tank. This tank is a concrete structure, which should be completed in five days. As the three Ecuadorian workers have no experience in working with concrete, Carlos is concerned about their ability to safely and correctly complete the project. He thinks Tencasa should increase jobsite safety measures and/or hire appropriately-qualified workers to complete the tank construction.

Carlos meets with his boss and recommends that Tencasa hire qualified workers, implement additional jobsite safety measures, and legalize the Ecuadorian workers (thereby making them eligible for worker compensation benefits). Carlos' boss smiles upon hearing the proposals and gives Carlos an ultimatum: Carlos must finish the project with the workers he has. Furthermore, Carlos must forget the Ecuadorians' situation because they should be grateful they have a job, and if they are not grateful, there are plenty of other workers who would happily take their place.

Carlos does not know what to do. On the one hand, he knows that an accident could happen during the tank construction and he feels it is not fair to risk the health of the workers. But on the other hand, he knows that the Ecuadorians want their jobs. In addition, if Carlos successfully completes this job on time, he can get a permanent contract with the firm.

What should Carlos do?

Alternate Approaches and Survey Results for “Engineering Ethics in Spain – The Risky Tank” (Case 1041)

1. *Go on with the work.* The chances of having an accident are very low, and the Ecuadorians agree with completing the job. Accepting the risk is their decision, even if the Ecuadorians have to work 24 hours each day in order to complete the project on schedule. **Percentage of votes agreeing: 4%**
2. *Tell the authorities.* Although the Ecuadorian workers want their jobs, it is not fair to exploit employees by having them work at their own risk without

- medical insurance. Carlos should tell the authorities and report what is happening to others within his firm. [Percentage of votes agreeing: 21%](#)
3. *Withdraw from the position.* It is wrong to allow further exploitation of the Ecuadorian workers! Carlos should resign his position and go to the media to openly denunciate this kind of abuse. [Percentage of votes agreeing: 7%](#)
 4. *Withdraw, but without denunciation.* Carlos does not want to contribute to worker exploitation, but he realizes that the Ecuadorian workers are the most vulnerable. Carlos should resign his position as a matter of personal protest but say nothing to anyone outside the company, allowing the Ecuadorians to continue work and send money to their families. [Percentage of votes agreeing: 12%](#)
 5. *Discuss with engineer friends.* Carlos should tell his colleagues about the situation and solicit their recommendations about what to do. With this information, Carlos will better know what to do in the future, even if the advice does not remedy the current situation completely. [Percentage of votes agreeing: 14%](#)
 6. *Implement additional safety measures.* Carlos and the Ecuadorian workers agree to complete the construction work. But in order to increase jobsite safety, Carlos should require the Ecuadorians to take an intensive training course over the weekend (he and some friends will teach the course) that will show them how to more safely do the work. [Percentage of votes agreeing: 21%](#)
 7. *Personally complete the most dangerous tasks.* It is Carlos' first construction project and he does not want anyone to be injured. So, Carlos should personally complete the most difficult tasks himself during the next few days. This will stretch Carlos' responsibilities, but the tradeoff is justified. [Percentage of votes agreeing: 3%](#)
 8. *There is no dilemma.* Where is the moral dilemma? All agree with carrying on with the construction. The Ecuadorian workers know what they are doing and have assumed the risks in order to have high-paying work. [Percentage of votes agreeing: 2%](#)
 9. *Look to the future.* If Carlos finishes the project on schedule, he can use his influence and success to persuade Tencasa to obtain papers for the (now experienced) Ecuadorian workers. This project is nothing less than an opportunity to regularize the Ecuadorians' work situation. [Percentage of votes agreeing: 6%](#)
 10. *Take matters in his own hands.* Carlos knows that it is both illegal and unfair to have workers without papers, and he cannot continue to allow this. At the peril of losing his job, Carlos should by-pass his boss and start

the paperwork to legalize the Ecuadorians' situation. [Percentage of votes agreeing: 10%](#)

Some observations on engineering practice in Spain as compared to the United States:

One difference between engineering practice in Spain versus the United States is that in Spain, there is no limitation on engineering practice due to the engineer's age. Young engineers can design, build or supervise a project if they have been hired for that. Hence, in very big companies which carry out large projects, it is normal to find a senior engineer with several young assistants who carry out the whole project, while in small companies with small projects, young engineers are in charge either to design or to build the construction.

In contrast, engineering licensure laws in the United States would not allow a young engineer so much freedom. Rather, a young engineer in the United States (identified as an "engineer intern" or "engineer-in-training") would be required to perform all engineering work under the direct supervision of a more experienced, licensed engineer. With respect to professional responsibility, the engineer who supervises the work would be legally responsible for the work; such a heavy responsibility would not be given to a recent engineering graduate. These types of internships typically persist for a minimum of four years, and only after obtaining the professional engineer's license would an individual be allowed to do projects on his/her own.

Another difference between Spanish and United States engineering practice is that in Spain there are three partners in an engineering project: the *designer*, the *builder* and the *supervisor*, and all of them should be engineers. The *designer* designs the project, the *builder* constructs it, and the *supervisor* ensures that the builder does everything as it has been specified. The builder and the supervisor must be different entities (persons), but the designer can serve dual roles; that is, be both designer/builder or designer/supervisor. In fact, the designer is frequently the supervisor of his/her project.

This is not typical for public works projects in the United States. Because of the highly developed division of labor, it would be unusual for an engineer to both design and construct a project. These are separate job functions, and usually the engineer would only do the design. Other persons; that is, building contractors, would do the construction and these persons would not necessarily be engineers. And in many cases, a different engineer might perform a quality control function on behalf of the project owner during the construction process, but even this role does not strictly parallel the supervisor function found in Spanish engineering practice.

Forum Comments from Respondents

1. It is difficult to imagine a situation where Carlos would not be morally obligated to challenge his company's practice (policy?) of hiring illegal

immigrants. Over the long term, such a practice can only lead to problems. The place to start is to get advice, ideally from experienced and trusted coworkers. Ignoring the situation is not a good approach.

Comments from Board of Review Members

1. Things ARE done differently overseas, and it is appropriate to pay attention to the internationalization of the profession and adapting to overseas ways of doing business. The actual ethical dilemma is timeless -
- a young engineer given the "take it or walk" ultimatum by his supervisor -
- and the context is less important than the tension created. It can be observed that "walking" is itself a means of applying pressure to Carlos' supervisor, because to do so would cause the project to not finish on time.
2. This international case embodies a universal situation; namely, the dilemma of the appropriate treatment of staff that you have become friends with, in addition to appropriate business practices and appropriate supervision of staff. These constitute a good combination of things to think about.
3. The fact that Spain has engineering practices different than those in the United is beside the point. It is probable that there are engineering companies hiring illegal Mexicans who are doing exactly the same thing in the United States.
4. It is a common dilemma for a new engineer to cope with "accepted practice" on a job site or the office work place even if that person realizes the practice is wrong or inappropriate. An interesting international component of this case is whether the employment of workers without "working papers" is illegal or only unethical for an employer in Spain. I also think that including international situations ... not simply situations as viewed by Americans working outside the US... can make significant strides in helping all engineers view issues more broadly. Many times, individuals (to include Americans) cannot appreciate the sensitivity or importance of an issue from the perspective of those working in different legal, cultural, and economic situations. Of course, just because we eventually understand another's position is no reason for us to find their opinion to be in our best interests. However, it is an essential first step in achieving win-win solutions.