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This paper began with an invitation from Japan a month after the disaster at Fukushima I Nuclear Power Plant began on March 11, 2011. The paper was to be presented six months later (October 30) — at a conference where I was already scheduled to present a paper on the use of imaginary cases in ethics (Davis, 2012). The disaster was still very much the province of journalism. Its outlines certainly lacked the stability of history. Of course, even history, though it generally seems stable, is not entirely so, being subject to dispute here and there and to radical revision every now and then. At first, Fukushima’s facts changed almost daily — if by “facts” we mean those descriptive propositions about which there is general agreement. After a while, the changes were less frequent and more a matter of addition than correction. Today, a year after I began work on the paper, the outline of the disaster seems settled. Dispute now concerns only details, such as how much land, if any, will have to be abandoned for some years, how many premature deaths are to be expected because of radiation released during the disaster, and so on. At some point, I had to stop worrying about the facts and report my reflections. I stopped worrying about the facts on October 15, 2011. Since then, I have changed “a fact” only when a reader or auditor pointed out that it was no longer a fact.

Three Nuclear Disasters and a Hurricane:

Some Reflections on Engineering Ethics

Michael Davis

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Abstract

The nuclear disaster that Japan suffered at Fukushima in the months following March 11, 2011 has been compared with other major nuclear disasters, especially, Three Mile Island (1979) and Chernobyl (1986). It is more like Chernobyl in severity, the only other 7 on the International Nuclear Event Scale; more like Three Mile Island in long-term effects. Yet Fukushima is not just another nuclear disaster. In ways important to engineering ethics, it is much more like Katrina’s destruction of New Orleans than like any nuclear disaster. It is (primarily) a consequence of a natural disaster, the enormous earthquake and tsunami that wrecked much of northeast Japan. One lesson of Fukushima, one shared with Katrina, concerns the different roles engineers have at different stages in an engineering project (planning, designing, management, and operations). In the planning stage, engineers seem to have relatively little power to affect certain early large-scale trade-offs between public safety and public welfare. Another lesson may be the importance of not leaving complex technical systems untended. The events that made the disasters at Three Mile Island and Chernobyl inevitable lasted only a few minutes or hours; the events that made the disasters in New Orleans and Fukushima inevitable were spread over several days. Fukushima avoided a more serious disaster because the plants were not abandoned in the way New Orleans was. A third lesson concerns our ideas of heroism, especially our sense that heroism is sometimes one’s duty. An engineer’s duty sometimes includes protecting others from harm even at the risk of the engineer’s life.

Keywords: Chernobyl, Fukushima, Katrina, Three Mile Island, precautionary principle
Three Nuclear Disasters and a Hurricane
Michael Davis
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Why Compare These Four Disasters?
The nuclear disaster that Japan suffered at Fukushima has been compared with other major nuclear disasters, especially Three Mile Island (1979) and Chernobyl (1986). It is more like Chernobyl in immediate destructiveness, the only other 7 on the International Nuclear Event Scale (the upper limit of which is 7). It is more like Three Mile Island in probable long-term effects (though Fukushima’s long-term effects are likely to be substantially worse than Three Mile Island’s). To date, Chernobyl seems to have directly killed thirty-one reactor site workers, to have caused more than three hundred to have received significant radiation doses. Estimates of future cancer deaths due to accumulated radiation exposures in the population living near Fukushima have ranged from none to a non-peer-reviewed “guessimate” of a thousand. No one died in the explosions at the plant or from subsequent radiation exposure (though subsequent workers cleaned up the evacuation of hospitals in the exclusion zone may have caused many as many as forty-five more deaths). The earthquake or tsunami, rather than a nuclear accident, seemed to be responsible for the few employees severely injured or killed at the plant. (Wiki, “Fukushima Daiichi”)
The discussion of Fukushima below relies not only on this source but also on Wiki, “Fukushima I”. Though I shall hereafter refer to “Fukushima”, it is in fact Fukushima I (Fukushima Dai-ichi) that I shall be referring to. There is also a Fukushima II (Fukushima Dai-ni). For details, see Wiki, “Fukushima II”.

Why Compare These Four Disasters?
The first concerns the different roles engineers have at these other disasters. Here I shall focus on four lessons: the importance of not leaving complex technical systems untended. Engineering systems do not work long without engineers. A fourth lesson may concern the way engineers should respond, and typically do respond, to engineering disasters. They should take responsibility for limiting the harm as well as for fixing the underlying problem, even if limiting the harm involves risking their lives. To see what I mean, let us consider these four disasters in greater detail, beginning with the first.

Three Mile Island
Three Mile Island was a “normal accident”, that is, it began with ordinary failures of equipment and practice within a plant itself operating normally. Pernrow 1984 also describes Three Mile Island as a “normal accident”. While I agree that it was a “normal accident” in its sense, my use of that term is somewhat different. I mean simply that the accident was a product of what engineers normally do rather than a product of incompetence, negligence, corruption, or other unusual conduct (such as experimentation). During the night of March 27-28, 1979, workers were engaged in routine cleaning of a blockage in one of Reactor 2’s eight condensate polishers (filters for the secondary cooling loop). At 4 am, the pumps feeding the polishing stations stopped. We still do not know the cause of the stoppage. When a bypass was then opened to start the cooling system, a crisis developed, the primary water pumps were stopped at 4:39 am. After almost eighty minutes of slow temperature rise, the primary loop’s four main pumps began to suffer damage as a mixture of steam and water passed through them. The operators then shut down the pumps, believing that natural circulation would continue the coolant water movement, but steam in the system (the stuff the product of rising temperature) prevented coolant flow through the core. As the coolant stopped circulating, it increasingly turned to steam. Just as the temperature was building up to a level of trouble, the coolant level fell so low that the top of the reactor core was exposed to the steam. Intense heat then caused a reaction between the steam in the reactor core and the nuclear fuel-rod cladding. That reaction burned off the cladding and damaged the fuel pellets. The pellets released more radioactivity into the reactor coolant, producing a hydrogen gas explosion that led to full explosion in the containment building in the afternoon.

At 6 am (two hours after the incident began), there was a change of shift in the control room. A new arrival noticed that temperature readings were off scale. The reactor core and holding tanks were too high and used a backup valve to shut off the coolant venting through the relief valve. But, by then, about 120,000 liters of coolant had already escaped from the plant. At 7 am (almost three hours after the incident began) did contaminated water reach radiation-activated alarms. By then, the radiation in the primary coolant water was around three-hundred times higher than usual. The plant was seriously contaminated and the reactor’s core had suffered a partial meltdown.

The Nuclear Regulatory Commission (NRC) may not have been aware of the magnitude of the disaster, a typical engineer’s response. Its report ended with recommendations for changes in controls, quality assurance, maintenance, operator training, management,
and communication of important safety information. There was no finding of negligence or more serious wrongdoing having caused the disaster, no suggestion that major redesign of nuclear plants was needed, and no proposal to rethink the place of nuclear energy in the generation of electricity. (Rogovin 1980, pp. 89-93, focused mainly on changes in emphasis and procedures at the NRC; Kemeny 1979, pp. 61-73, focused on “attitudes” and reports do, however, contain much criticism of other aspects of how Three Mile Island operated.

Chernobyl

Chernobyl was not a normal accident. Its cause was an engineering experiment which, though successful, lacked proper approval. That is not to say that the experiment was unjustified, fundamentally improper, or indeed abnormal.

Even when not actively generating power, nuclear reactors require cooling to remove heat produced by the natural decay of nuclear fuel. Chernobyl’s pressurized water reactors (different in design from Three Mile Island’s) used water flowing at high pressure to remove heat. When an emergency shutdown, the core could still generate a significant amount of residual heat. If not removed, the heat could cause core damage (as it did at Three Mile Island). If the power grid failed, power to run the plant’s cooling system might be unavailable from outside for far too long.

Chernobyl’s reactors had three backup diesel generators. Each generator required fifteen seconds to start up but took over a minute to attain the speed required to run one of the main coolant pumps. Chernobyl’s engineers judged this one-minute power gap unacceptable. Too much can happen in a nuclear reactor in a minute when the cooling system is not working. Analysis indicated that one way to bridge the one-minute gap was to use the mechanical energy of the steam turbine and residual steam pressure to generate electricity to run the main coolant pumps while the generators came back on line. It required 1.5 RPM, frequency, and voltage. But, of course, the analysis had to be confirmed experimentally. The engineers had to work out and then prove a specific procedure for effectively employing residual momentum and steam pressure.

Previous experiments—in 1982, 1984, and 1985—had ended in failure. The 1986 experiment was scheduled to take place at Reactor 4 during a maintenance shutdown. The experiment focused on refinements in the switching sequences of the electrical supplies for the reactor. The experiment was set up with an automatic emergency shutdown. Because no danger to the reactor was anticipated, the engineers did not formally coordinate the experiment with either the reactor’s chief designer or scientific manager. Indeed, the experiment did not even have the approval of the onsite representative as the Soviet nuclear emergency procedure. Only the director of the plant approved it (and even his approval did not follow standard procedures).

The experiment began just after 1:23 am on April 26th. The reactor was shut down, and an emergency generator started before several minutes had even passed. The turbine generator supplied the power for the four main circulating pumps as it coasted down. The experiment was all but complete forty seconds later. But, as the connections to the reactor core to keep the steam turbine and residual steam pressure to generate power for the four main circulating pumps as it coasted down. The experiment was all but complete forty seconds later. But, as the connections to the reactor core to keep the temperature down.

If conditions had been as planned, the experiment would almost certainly have been carried out safely. The Chernobyl disaster resulted from attempts to boost the reactor power too far, nearly shutting down the reactor. Control-room personnel soon decided to restore the power and exit with the reactor control rods, but several minutes elapsed between the extraction and the time that the power output began to increase and stabilize at 160–200 MW. The extraction withdrew the majority of control rods to the rods’ upper limit, but the rapid reduction in the power during the initial shutdown and subsequent operation at less than 200 MW led to increased dampening of the reactor core by the control rods’ neutrons, decreasing the core temperature. But, of course, the analysis had to be confirmed experimentally. The engineers had to work out and then prove a specific procedure for effectively employing residual momentum and steam pressure.

As the power dropped to approximately 300 MW during the experiment, one of the engineers conducting the experiment mistakenly inserted the control rods too far, nearly shutting down the reactor. Control-room personnel soon decided to restore the power and exit with the reactor control rods, but several minutes elapsed between the extraction and the time that the power output began to increase and stabilize at 160–200 MW. The extraction withdrew the majority of control rods to the rods’ upper limit, but the rapid reduction in the power during the initial shutdown and subsequent operation at less than 200 MW led to increased dampening of the reactor core by the control rods’ neutrons, decreasing the core temperature.

Fukushima

The disaster at Fukushima fits neither of these patterns. The accident was not normal or the result of an engineering experiment. It was also not the result of operator negligence, incompetence, or misconduct. The maintenance shutdown was not as planned, and it was not normal. Any normal reactor designer or operator would have known that the Fukushima reactors would almost certainly have been carried out safely. The Chernobyl disaster resulted from attempts to boost the reactor power too far, nearly shutting down the reactor. Control-room personnel soon decided to restore the power and exit with the reactor control rods, but several minutes elapsed between the extraction and the time that the power output began to increase and stabilize at 160–200 MW. The extraction withdrew the majority of control rods to the rods’ upper limit, but the rapid reduction in the power during the initial shutdown and subsequent operation at less than 200 MW led to increased dampening of the reactor core by the control rods’ neutrons, decreasing the core temperature. But, of course, the analysis had to be confirmed experimentally. The engineers had to work out and then prove a specific procedure for effectively employing residual momentum and steam pressure.

When the core overheated, the control rods would be inserted to absorb neutrons and slow the core. This controlled insertion of control rods into the reactor core was carried out at the normal frequency of 25.4 cyclic insertions per minute during the experiment. The 1.5 MW of heating required for the experiment to reach the 300 MW setpoint was supplied by the connection of the emergency generator to the reactor core rather than by another means.

Differences in the Fukushima reactors’ design and conditions of operation contributed to events that led to the core damage. One key difference was in the Fukushima reactors’ design. The core of a pressurized water reactor is contained in a pressure vessel with a containment building constructed to withstand any tsunami up to 5.7 meters, but the great wave that struck forty-one minutes after the quake was fifteen-meter high. It flooded the entire plant, including generators and electrical switchgear in reactor basements. It also broke the remaining connection with the national electrical grid. All conventional power for cooling was lost. Only one backup remained: emergency batteries, able to run some of the monitoring and control systems for up to eight hours. Replacement batteries and mobile generators were soon dispatched to Fukushima, but collapsed bridges, debris-strewn roads, and similar obstacles delayed them. The first replacements did not arrive until 9:00 pm (six hours after the first call went in).

The arrival of the replacement batteries and mobile generators did not end the crisis, however. They had to be installed. The normal connection points were in floodwaters or debris. There was also difficulty finding suitable cables. Work to connect batteries and generators was still continuing twenty-four hours after the quake when there was an explosion in Reactor 1’s building. The side walls of the reactor building had collapsed, and debris covered much of the floor and machinery.

The roof of the building was designed to provide ordinary weather protection, not to withstand an explosion or to act as containment for the reactor. In the Fukushima reactors, the primary containment surrounded the reactor’s pressure vessel. The top floor had no real protection, only water-filled pools for storing new fuel ready to be craned into the reactor and used fuel ready for disposal. This first explosion was probably caused when...
hydrogen collected under the roof. Exposed fuel rods became very hot and reacted with steam, oxidizing the cladding and releasing hydrogen. The hydrogen would have leaked upward. Safety devices normally burn such hydrogen but in this case, the concentrations of hydrogen were too high to ensure safety. These systems seem to have failed when the electrical power did.

Reactor 1’s containment survived the explosion. There was a minor leak of radioactive material, although there was an increase in radiation following the explosion. The explosion at Reactor 1 injured four workers. But this was only the beginning. Hydrogen gas was also collected at the other five reactors. Over the next few days, hydrogen explosions destroyed the upper cladding of the buildings for Reactor 3 and 4 and the containment inside Reactor 2. Several fires broke out at Reactor 4. In addition, spent-fuel rods stored in the spent-fuel pools of Reactors 1-4 began to overheat as the water level dropped. Fear of radiation leaks led to evacuation of all non-essential persons within a twenty-kilometer radius of the plant.

In short, the Fukushima plant was overwhelmed by forces from outside well beyond what it was designed for. Without heroic efforts by plant staff, some of whom died, the plant could have been a complete disaster. Even with those heroic efforts, several weeks passed before the plant could be said to be under control of the plant control operators. One generator at Reactor 6 was restarted on March 17 (six days after the quake) allowing some cooling at Reactor 5 and 6, the least damaged. Connection to the power grid was said to be more or less under control. One day after the initial large explosion, the second major explosion at Reactor 3, the containment in Reactor 3 was destroyed.

Katrina

When it struck New Orleans on August 29, 2005, Katrina was a category 3 hurricane, a large storm but no larger than storms that strike the Gulf Coast almost every year. The top of the hurricane scale is 5. Katrina was nonetheless unusually destructive because it moved so slowly that anything in its path was subject to heavy rains and high winds for many hours. The rain and high winds were worst at Task Force JFK (IPET) issued its (draft) Final Report. IPET was an independent team of more than one-hundred-fifty international and national experts from more than fifty different government organizations, universities, and private companies. The U.S. Army Corps of Engineers commissioned IPET a few weeks after Katrina hit New Orleans. It was to analyze how the levee system performed. Though many questions of detail remain unsettled, this nine-volume report, is (more or less) the last word on both the causes of the Katrina disaster and means of preventing similar disasters.

IPET reports a “system” that grew up piecemeal, only in part under the control of the Corps of Engineers, the government agency officially in charge of waterways. In some places, the system failed because a levee or flood control system, engineers are generally only “problem solvers”. One important function they have is helping to define problems — or re-define them when it becomes clear that the client or employer has not asked the right questions.

By designing, I mean the actual drafting of specifications, floor plans, and so on necessary to construct or modify the technological artifact in question. By planning, I mean the actual drafting of specifications, floor plans, and so on necessary to construct or modify the technological artifact in question. By planning, I mean the actual drafting of specifications, floor plans, and so on necessary to construct or modify the technological artifact in question.

Conclusions

We can, I think, distinguish four sorts of engineering decision in these four case studies: planning, designing, management, and operations. (In a different context, I would include “disposal” in this list. I do not include it here only because none of these disasters concerns disposal as such, though Fukushima’s problems were due, in part, to fuel rods waiting disposal.)

By planning, I mean such decisions as whether to build at all, where to put it, and the upper limit of its budget. For such decisions, engineers are most important for vetoing certain options, for example, a location because the risk of earthquake makes safe construction too expensive. They are also important for suggesting alternatives, for example, conservation or a gas-fired plant rather than a nuclear plant. Engineers are not, at least, as important for “problem solvers”. One important function they have is helping to define problems — or re-define them when it becomes clear that the client or employer has not asked the right questions.

But, for any large undertaking such as a nuclear plant or flood control system, engineers are generally only one party in a complex social decision in which the other parties include employer, government officials, experts of various sorts (such as geologists), bankers, and civil society (or “the public”). Perhaps the most important contribution engineers can make to planning is developing minimum standards for evaluating and responding to specific risks and benefits of the technology in question.

By designing, I mean the actual drafting of specifications, floor plans, and so on necessary to construct or modify the technological artifact in question. Planning has set limits, engineers are generally free to work within those limits, for example, to design the one that the old one. For example, the Corps has been replacing the five-meter pilings holding canal walls in place with pilings that would go down fifteen and a half meters (three times as deep). The Corps agreed that the use of i-walls along the canals would work (even with the support of a simple earthen levee) was a mistake. It is replacing the canal’s i-walls with heavily-braced T-walls locked down by twenty-one meter H-piles angled out in two directions. The use of simple i-walls in place with the changes in design that government was unwilling to pay for without a major disaster and may yet lose interest in paying for before the work is complete.

Katrina flooded New Orleans because the levee system failed catastrophically. Much of the disaster, however, occurred hours after the storm had moved inland as water poured through holes in levees and filled much of the city. There was no attempt to repair the levees immediately. Indeed, for many days, there was no attempt to repair anything. New Orleans even to report to Washington that everyone who could be evacuated had been. By August 31 (two days after Katrina struck), 80% of New Orleans, a city almost empties of inhabitants, was under water, with every part of the city excepting the lowest fifth. The water lingered for weeks.

On March 26, 2007, a year and a half after Katrina passed through New Orleans, the Interagency Performance Evaluation Task Force (IPET) issued its (draft) Final Report. IPET was an independent team of more than one-hundred-fifty international and national experts from more than fifty different government organizations, universities, and private companies. The U.S. Army Corps of Engineers commissioned IPET a few weeks after Katrina hit New Orleans. It was to analyze how the levee system performed. Though many questions of detail remain unsettled, this nine-volume report, is (more or less) the last word on both the causes of the Katrina disaster and means of preventing similar disasters.

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By designing, I mean the actual drafting of specifications, floor plans, and so on necessary to construct or modify the technological artifact in question. Planning has set limits, engineers are generally free to work within those limits, for example, to design
A nuclear plant that will fail slowly rather than quickly or cool rather than heat up if left alone. Only when a planning limit is too strict do engineers have a reason to restart the planning process, for example, by suggesting a new budget be raised to provide an adequate margin of safety.

By management, I mean overseeing the operations of a plant, including choosing, training, and directing operators. An independent system is not technical—and is therefore not the domain of the engineers. But, for nuclear plants or flood control systems, the managers will typically be engineers. For engineers, part of technical management is remaining alert to possible improvements in staff, procedures, and equipment. So, for example, a manager who noticed that operators at Three Mile Island often missed readings on an important gauge because equipment blocked their view of it should recommend, or order, that the control board or control room be redesigned to improve the view.

By operations, I mean actually doing what is necessary for the plant or technical artifact to work. While engineers do not, in general, operate plants, they do constitute most of the operators in a nuclear plant. So, for example, at Chernobyl, they pushed the button that engaged dampening rods into the core. While operators can be reprimanded, and their acts reversed, they are, while acting as operators, completely in control of what happens. One of the features we noted in our discussion of the three nuclear disasters is how quickly things can go wrong. What goes wrong in a nuclear plant does not, of course, go seriously wrong for just one reason. Because engineers typically design nuclear plants with a large safety factor, several systems must fail before anything goes seriously wrong. But, given the complexity of a nuclear plant, it is reasonable to expect that some things will go wrong from the very beginning, even with proper maintenance and inspection, technical systems sometimes fail unexpectedly. That being so, it is also reasonable to expect (given the laws of statistics) that all of the independent systems will fail together—an empirical reminder that even a low-probability event will, given a large enough population, become highly probable.

If we look at our four disasters, two—Three Mile Island and Chernobyl—seem unrelated to any ordinary planning or design failure. Of course, with a higher budget, the Three Mile Island plant might have had more working backup for its cooling system. However, for Chernobyl, we have always have the option of doing something much safer, such as going to the theater or buying government bonds. For nuclear energy, our choices today are more difficult. Fossil-fuel plants together (though not individually) threaten us with a world too hot to live in. Hydro-electric dams flood lowlands when they fail and are often not available as an alternative to nuclear power. Failing hydro-electric dams may have killed many more people than nuclear-power-plant accidents have (depending on how deaths are calculated). Just one dam failure, that of the dam at Banjiao, China, in 1975, seems to have killed at least 3,000 people (almost 45,000 through resulting disease and famine (Wiki, “Banjiao”). Three Mile Island itself is only a hundred miles or so from the town of Johnstown, the site of the “Johnstown Flood,” which killed more than 2,200 people, the result of a dam failing in 1889 (Wiki, “Johnston Flood”). In contrast, no one died at Three Mile Island and statistical demands worldwide to be expected from the radiation that escaped is much smaller.

Nowhere has wind and geothermal met the demand for electricity in an industrial country. And so on. Even water-power generation relies like the electric car on the axiom of prudence in planning: if we (society at its rational best) would reject any plausible benefit in exchange for suffering that harm, we (that part of society making the decision) will, all else equal, reduce any design that risks that harm (however small the probability—so long as it is finite). Since this principle applies when we know both the harm in question and its probability, it is (technically) a precautionary principle (though its spirit is much the same). It is, in this respect, more like advice frequently given to gamblers betting in games of chance with known odds (“Don’t bet more than you can afford to lose”). Precautionary principles are about dealing with uncertainty. (See, for example, Andorno, 2004.)

I am proposing a principle that most of these nuclear accidents were limited to one reactor. At Fukushima, the spread to four of the six reactors— and might have spread to the other two as well for the restarting of a diesel generator at Reactor 6 to provide power for cooling the fuel in the holding pools of Reactors 5 and 6. Workers also removed roofing from Reactors 5 and 6 to slow hydrogen to enable maintenance and inspections similar to those that had damaged the other four units. This aspect of what happened at Fukushima is a reminder that part of what makes engineering so reliable is that engineers do not have to hope that the hypothesis is true. Despite its disaster, the engineers at Fukushima were not as successful as the engineers at Three Mile Island and Chernobyl. Both of those disaster were limited to one reactor. At Fukushima, the disaster spread to four of the six reactors—and might have spread to the other two as well for the restarting of a diesel generator at Reactor 6 to provide power for cooling the fuel in the holding pools of Reactors 5 and 6. Workers also removed roofing from Reactors 5 and 6 to slow hydrogen to enable maintenance and inspections similar to those that had damaged the other four units. This aspect of what happened at Fukushima is a reminder that part of what makes engineering so reliable is that engineers do not have to hope that the hypothesis is true. Despite its disaster, the engineers at Fukushima were not as successful as the engineers at Three Mile Island and Chernobyl. Both of those disaster were limited to one reactor. At Fukushima, the disaster spread to four of the six reactors—and might have spread to the other two as well for the restarting of a diesel generator at Reactor 6 to provide power for cooling the fuel in the holding pools of Reactors 5 and 6. Workers also removed roofing from Reactors 5 and 6 to slow hydrogen to enable maintenance and inspections similar to those that had damaged the other four units.
other engineers may not be able to make the necessary changes immediately because of budget or schedule, or at all because changes that they have already made bar the improvement in question. Engineers may also find an alternative way to achieve the same end. For these reasons (and perhaps others), nuclear plants, however alike at birth, tend to grow into noticeably different individuals, much as biological plants do.

Some people, especially philosophers, seem to think of those who stayed on at Fukushima—who those, for example, worked in the dark in cold waist-high radioactive water to rest the generators—as engaged in “supererogatory” conduct, that is, as engaged in conduct above and beyond what morality requires. The engineers I have discussed this with seem to view the conduct as heroic but required (supposing the “workers” in question to be engineers). An engineer who left when needed would have acted unprofessionally; he would have failed as an engineer even if he left to save his life or look after his family. Engineering sometimes requires heroism (a significantly higher standard than proposed in Alpern 1983)—or so the engineers I have talked with about this seem to think.

Acknowledgments


A Pluralist Ethical Decision-making Procedure

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Decisions about the moral value of an action, rule or public policy cannot be reduced to a verdict resulting from the application of traditional tests based on the major ethical theories, despite the fact that handbooks still unanimously support this view. The history of ethical test results is more one of surprises than one of predictability. You would expect, for instance, that people who adopt the same moral doctrine do this in order to approach issues in the same way, including the moral assessment of actions. We all believe that this is the main reason it is useful to embrace the same moral creed. Therefore it seems strange to find that several members of the Romanian Parliament, all active supporters of Christian morality, assessed the legalization of prostitution in opposing ways. On the other hand, it is also strange that two people who adopt different ethical theories—precisely because they offer distinct explanations of moral phenomena—can frequently assess actions in the same manner. When a utilitarian and a Kantian—or a follower of Christian ethics and one of Muslim ethics—debate issues, it is somehow surprising to see them judging situations in the same way in most cases, despite the fact they declare themselves to be supporters of opposing ethical beliefs. Are these beliefs really opposing? In general, it appears that use of tests based on distinct or even opposing theories, such as utilitarianism and Kantianism, can result in different verdicts, but in most cases it results in convergent ones (Kantian and utilitarian moral duties are, ultimately, the same). On the other hand, if we dogmatically adopt a single theory and apply the same test repeatedly to the same action we usually get similar results, but some divergent ones also appear (see the cases of divergent utilitarian assessments of the same case given as examples in the textbooks).

Abstract

This paper claims that the use of several moral tests to assess the ethics of a new policy is unavoidable. All the efforts to make credible a methodological monism—by critical or reductionist strategies—have been unsuccessful; moreover, it must be acknowledged that even if there were a single test, when applied successively or by different people it would usually give divergent results. The main aim of the paper is to propose a pluralist procedure of ethical decision-making, using a set of proper ethical tests (such as utilitarian, Kantian, Christian, principlist and casuist) in the frame of an “ethical Delphi” procedure intended to make convergent the supposed variety of verdicts. This pluralist testing process, made by moral experts, is only a fraction of a more complex procedure intended to deliver social sanction for a new moral policy. This longer procedure also shows that the adoption of a new moral policy, rule or law is not only a question of passing a strict ethical test, but also a political (i.e. multi-criterial) decision. In general, the adoption of a new moral rule does not rely solely on an ethical test, but is essentially the outcome of a complicated social agreement. That is why in academic applications of the usual moral tests we do not take a moral decision on a new case, but merely simulate it.

Key words: ethical decision-making, ethical pluralism, ethical Delphi, pluralist model